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Sidelights on the Cleaning and Dyeing Industry

Magnitude of the Industry—General Processes and Agents Used—Naphtha House Process—Methods of Washing—Recovery of Solvent—Spotting and Finishing—Garment Dyeing—Cleaning Before Dyeing—Types of Dyes Used—Dyeing Procedure

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HOW often the garment cleaning and dyeing industry is mentioned as a hole-in-the-wall trade carried on in the back room and cellars of the corner cleansing or tailor shops! There one may come in contact with an illiterate foreigner obviously lacking any conception of technical knowledge. It is true that many people, particularly those not coming in direct contact with a modern cleaning or dyeing plant, judge the industry by the corner tailor shop that hangs out the sign, "Cleaner, Dyer." Of course, there are many tailors and pressing-shop proprietors of the highest moral type who make no pretense at fooling the public into believing that work other than pressing is done by them on the premises; but still the public—and, unfortunately, that includes many technical and professional men—has no idea of the magnitude of the plants in which the cleaning and dyeing is actually done.

At the Central States Association convention at Minneapolis last July, John L. Corley estimated that there are to-day at least 225,000 places in this country and Canada claiming to be cleaning establishments or dry cleaners; and the public so considers them. He estimated that there are approximately 2,000 power plants, mostly small plants, outside the association and 1,400 plants members of the National Association of Dyers and Cleaners. It is these 3,400 plants that do the dry cleaning of the country.

General Processes and Agents Used

Cleaning plants are divided into two general classes—wholesale plants and retail plants. The former are those plants that do the work for the small tailor and pressing shops, and for all those who act as agents for the work, such as laundrymen, hotel keepers, etc. The retailers are those who deal directly with the individual. Although the line is quite sharply defined, there is considerable overlapping, especially in small towns, and many large wholesalers in the big cities have important retail routes.

Garment cleaning is usually divided into two general classes—dry cleaning and wet or steam cleaning. The latter is a water cleaning necessary for certain kinds of goods and for certain kinds of soil or stains, especially those unaffected by dry cleaning. Dry cleaning refers to cleaning carried out with solvents that do not have a water action on the goods. It is necessary for practically all woolen and silk garments and such garments as are dyed with colors fugitive to water. The solvents used are the various fractions of petroleum, benzol and, to a lesser extent, carbon tetrachloride. Although there are some other organic solvents that may be used, the above-mentioned are of practical significance.

Carbon tetrachloride has been used lately in the Salt Lake City district by a few cleaners, and is considered by them a practical product, according to items in the trade papers. It is an excellent solvent for grease and oils, and is non-inflammable. In fact, it is used a great deal as a fire extinguisher. Its non-inflammability is of major importance in its use. It is considered rather difficult to recover, and has a very harmful effect upon those with whom it comes in contact. For these reasons, and also its comparatively high price, it is of minor importance.

Benzol and the petroleum fractions are depended upon almost entirely. Of the petroleum products, various fractions approximating motor gasoline are used, ordinary motor gasoline being most popular. Lately a higher fraction known as semi-non-inflammable gas, or Stoddard's gas, has gained great favor with cleaners, due to its higher flash and fire points and the consequent lessening of the fire hazard. This product flashes at 100 deg. Fahr. and boils between 300 deg. Fahr. and 410 deg. Fahr. Due to the higher boiling point there is much less loss from

evaporation, and it is claimed that this saving very nearly offsets the difference in price. Benzol is a more expensive product than gasoline at first cost, but it is claimed that an efficiently conducted plant can lower its ultimate money value to that of motor gasoline. It is an excellent solvent for many of the stains encountered on garments, but, due to its poisonous effect on workmen and its fire and explosion hazard, it is not as much used as would be the case if these bad features could be overcome.

Naphtha House Process

Let us follow a lot through the cleaning process. The garment collected from the home by the plant's driver or brought to the office maintained by the plant owner, or perhaps left at the tailor shop, is given a number to identify it in process and to insure its safe and prompt return to its owner. The garment is then delivered to the marking department, where the number designated on the ticket is stamped on the lining at a place that does not show, or the number is stamped on a tape that is tied or stitched to the garment. Up-to-date plants use an electric power machine and a special ink that is unaffected by water or the dry-cleaning agent. After marking, the garments are usually sorted, the whites being separated from the colored goods, and the colors are subdivided into various lots, dependent on the depth of color and the degree of soil. The same sorting to a lesser extent prevails for the silks.

When a sufficiently large lot accumulates, which under ordinary fairly busy conditions takes but the time of sorting, the truck is run into the dry-cleaning room and placed in the washing machine.

The type of building in which the dry cleaning takes place is more or less rigidly regulated by State or city ordinance. The more progressive States are most exacting in their regulations governing the construction and operation of dry-cleaning rooms, or naphtha houses, as they are usually termed. Although in some of the smaller and more backward States it is permissible to carry out the operation of dry cleaning in a room of a business block or dwelling, and carry on various activities in the dry-cleaning room, the specifications are rigid in the larger and more progressive States. In Massachusetts, dry cleaning must be conducted in a one-story fireproof building set a specified distance from any other building. This building, or naphtha house, must be equipped with doors opening outward, of which there must be at least two, ventilating devices, open steam lines to be used in case of fire, an outside underground storage system for the solvent, and electric motors must be outside the naphtha room. The drying or deodorizing room may be in the same building, but it must be separated from the washing or naphtha room by an unpierced fire wall. The regulations, although very stringent, are wise; for whereas there is little danger to experienced workmen from naphtha or benzol, in the hands of the inexperienced it is an extremely dangerous product, due to its susceptibility to fire and explosion.

The actual dry cleaning is done in a washing machine resembling the ordinary laundry washer or the rotary hosiery dyeing machine—i. e., a perforated wood or metal cylinder that rotates within an outer shell. Dry-cleaning machines are made sufficiently tight so that the liquid will not leak out, and they are usually grounded to take care of any static electricity that may develop during the operation of the machine. The solvent is pumped from the underground tank into the machine, and when the cleaning operation is completed the dirty solvent is pumped to an underground tank for settling, to a clarifier or to a still.

Methods of Washing

There are two general classes of washing—the batch method and the clarified method. The batch method is the original method, and resembles closely the process used in laundries in wet cleaning. The goods are run a certain time in the naphtha or benzol, dry-cleaning soap and perhaps ammonia. The dirty solution is run off and fresh naphtha is pumped in and the goods given a rinse. The rinse solution is run out and sometimes another naphtha rinse is given. The goods are then placed in an extractor and whizzed until all the excess solvent is thrown out.

The method now used by most modern cleaners is the clarification method. In this method a machine similar to the well-known cream separator is used; and, in fact, the manufacturers of practically all the dry-cleaning clarifiers are also manufacturers of cream separators. The principle involved is that the naphtha coming from the washing machine is extracted at high speed, causing the water, dirt, etc., being heavier, to be thrown out and caught on disks, while the naphtha runs back to the machine clean and dry. The process is continuous, a constant stream of dirty naphtha running from the washes to the clarifier and the cleaned naphtha running back to the washer. In this way, instead of the goods running for some time in their own dirty solvent, as is the case when the batch method is used, they are being washed by a constant stream of clean solvent. And when this solvent runs perfectly clear from the washer the operation is complete and the goods are extracted.

After extracting, the garments are sent to the tumbler room or deodorizing department to dry them and remove all trace of naphtha. This is accomplished by means of drying tumblers. The principle of most tumblers is that the goods are placed in a large cylinder or basket and rotated while hot air is passed through them. While the principle is practically the same, the construction of the machines vary, and some are very elaborate and consequently expensive.

Recovery of Solvent

Gasoline, naphtha, benzol, etc., are quite expensive, and cannot be run down the sewer as one would discharge water after using it in a washing process. The solvent must be recovered for further use, and its recovery is of

vital importance to the cleaner. It is a scientific problem, and much credit must be given to the National Association of Dyers and Cleaners for its co-operation, resulting in the institution of an industrial fellowship at the Bureau of Standards, Washington, D. C. One of the important results of the research at the Bureau of Standards was the development of a simple yet efficient method of cleaning and purifying the solvent. The solvent is run into a large conical tank (the point at the bottom), mixed with an alkali (NaOH or Na_3PO_4) to saponify the dry-cleaning soap and grease, and is then agitated with a special charcoal which deodorizes it; and when finally the naphtha is run off after settling, it is sweet and water-white, or at most tinted but slightly yellow, and ready to use again. The dry-cleaning soap that has been referred to is a partially saponified oil—a soap perhaps only 15 per cent saponified. A true soap such as is commonly used with water would be useless in naphtha, as it would be insoluble.

There are two other general methods of recovery of naphtha. One is by distillation; and until the advent of the charcoal-alkali settling process recovery by distillation was very popular, but now it is considered a rather expensive proposition. The other method was used, and still is, by some of the cleaners catering to a cheap trade, and is the settling method. It amounts simply to allowing the dirty naphtha to stand long enough to allow the water and dirty particles to settle to the bottom, and then to decant off the more or less clear liquid. To hasten the process, sulphuric acid or caustic soda is sometimes added; but, of course, care has to be exercised in handling such products. However, the settling method is now considered obsolete by the progressive cleaners.

In addition to ordinary garments, rugs, furs, gloves and, in fact, almost any article constructed of textiles are cleaned in the naphtha room. Gloves are handled in special machines which, in addition to having rotary cylinders, have also brushes which aid in the cleaning. Usually a mixture of alcohol and naphtha is used on gloves instead of naphtha alone, as the alcohol removes water stains that the naphtha would leave untouched.

Spotting and Finishing

When completely deodorized, the garments are taken to the spotting department. Although the naphtha cleaning has removed most of the soil, there are many stains which that process does not affect. The spotting department is rightfully considered the most important and the most technical in the plant. A good spotter is most skillful and highly trained in the detection, analysis and removal of stains. Spotting is really a chemical operation, and a good chemist, once he understands the proper manipulation of articles used by the spotter, should make an excellent fancy spotter. Water and water-soluble spots, blood stains, paint, varnish, medicine stains, etc., are all removed by the spotters. In general, the solvent for the stain is dabbed on the spot and gently worked into it until it becomes soluble or can be brushed out, and then the ring that would likely form if an unexperienced person undertook the job is skillfully wiped or brushed out by the spotter. Silks usually are much more difficult to handle than woolen or worsteds, due primarily to their character to show the least stain and to resist its removal more persistently. Then, again, silks are dyed with such fugitive dyes and usually carry a large amount of water-soluble size that the spotter must be most skillful in preventing the size from moving and settling in rings or spots when he uses water on the stain. There are so many fibers and fabrics, so many stains, so many solvents used in removing the stains, that books have been written on the subject of spotting, and consequently it here needs to be taken up but briefly.

After all the spots are removed (in case much organic solvent is required for spotting, the goods are sent back to the naphtha house for a complete rinsing in the dry-cleaning machine) the garment is sent to the finishing room. Here the garment is steamed or pressed, or both, depending on the fabric and its construction. The multitude of presses, electric irons, steam boards, puff irons, pleating machines, etc., in the finishing room of a large plant bewilders the uninitiated, but each assists in reforming the garment to its original design.

When the pressing operation is completed, the garment is carefully inspected to make certain that all spots and stains are completely removed. A service undertaken by many plants is that of making minor repairs on garments, such as replacing lost or broken buttons, mending tears, etc. Passing the inspection, the garment is packed in a box or hung in a dustproof bag on a hanger for delivery to its owner.

Garment Dyeing, and How It Differs from Mill Dyeing

The dyeing department of the cleaning plant is a valuable and profitable integrant of the industry. As might be expected, the volume of work received by the dyeing department is very much smaller than that taken in for cleaning. Garment dyeing is an economy. Consider how many actually secure 100 per cent wear from their clothes! Regardless of the condition of the garment when the season passes, the suit or overcoat is laid aside, probably never to be worn again, simply because one tires of its color effect. Ladies are especially prone to wear a dress of excellent as well as expensive material two or three times, and feel that although the garment is in nearly perfect condition they can wear it no longer with any degree of satisfaction. Many have discovered the economy of garment dyeing which for a comparatively small expense produces a new gown or coat in so far as the associates are concerned. It is from such people—and their numbers are increasing in approximately the same proportion as those availing themselves to dry cleaning—that the garment dyer receives his work.

I have had several dyers and dyestuff salesmen tell me

that they considered garment dyeing the toughest proposition in the field of dyeing. Unlike the mill dyer, or even the commission dyer, who receives, as a rule, new goods of practically standard and known characteristics, the garment dyer receives his goods in all shapes, fibers, shades and conditions of wear, stain and sunburn, and he is expected to turn out a job of a good quality—and, what is more, he usually does.

Garment dyeing varies considerably from mill dyeing. Mill dyeing is largely a scientific, technical operation requiring a certain degree of art; in short, it is a science rather than an art. Garment dyeing, although it is rapidly assuming a position as a scientific operation, is still an art. This is due to the utter lack of uniformity in the product. It is seldom indeed that the garment dyer receives two identical articles to be dyed the same shade. Consequently he must take so many things into consideration that he proceeds from the viewpoint of art rather than science alone.

Cleaning Before Dyeing

It is definitely understood that good dyeing can only be done on clean material. For this reason it is of primary importance that the material for dyeing be absolutely clean. In the case of garment dyeing, the preliminary process of cleaning is really of more importance than the main process of securing the desired shade; for usually the customer is having the article dyed to cover some unsightly stain or fade, and unless a uniform shade is produced the customer will be, and should be, disappointed.

When the garment is received by the dyer he examines it closely. If he finds paint, grease or oil stains, or such stains as will not be removed by ordinary scouring, he sends it through the proper dry-cleaning process. If it shows simply ordinary soil and water-soluble stains, he gives it a thorough scouring with a slightly alkaline soap solution, which is then well rinsed out. Colors that show any tendency to run are stripped off as much as possible with a cool soda solution for woolen garments or hot neutral soap for silks. This scouring must be complete and thorough, or the dyeing will be a failure. In addition to the scouring and dry cleaning, such stains as still are unremoved must be taken out by further processes, such as bleaching, etc.

The clean, stainless, wet-out garment is now ready for dyeing. Although there is a considerable variation in the dyeing processes and the dyestuffs used, the dyeing is fundamentally similar to dyeing in mill or laboratory. As the range of materials is so great, naturally several processes of dyeing and types of dyestuffs are used. The bulk of garments received are woolen or worsted with cotton stitching, and sometimes silk stripes or linings, and silks with cotton stitching and often rayon embroidery. A considerable volume of rayon is handled by the garment dyer, and occasionally a Celanese or Lustron fabric shows up.

The colors desired are usually black, navy and dark browns. These shades form the bulk of the work. Next to them come the fashionable shades of the particular period. The last few years has seen a big demand for pansy, cranberry red, powder blue, light greens, and lately there has been a considerable call for yellows. Now there is a demand for the fashionable dark greens and chanel reds. There is always some call for practically all the shades shown on the season cards of the Textile Color Card Association.

Types of Dyes Used

The dyestuffs used are principally the direct colors that dye union. In addition to these, most dyehouses carry a large assortment of acid and basic colors, as well as many direct colors that do not work union, to be used for shading and for dyeing cotton goods, such as portieres. Practically all of the smaller plants and many of the larger dyehouses buy their union colors already mixed by the manufacturer or dealer. However, as is often the case, such mixtures, while they work well on a laboratory scale, are not as practical as those that may be worked up by the dyer from the straight colors, and so now in some cases straight colors are secured and the formulas are worked out in the dyehouse. Now that the manufacturers are producing dyestuffs of much superior quality, especially from the standpoint of fastness, the progressive garment dyer is changing to the improved line.

Dyeing Procedure

Dyeing is seldom carried on in machines. There have been many machines put on the market to facilitate the garment-dyeing operation, but as yet none has seemed to meet universal approval. It is noteworthy that the trade journals carry very few advertisements of garment-dyeing machinery, whereas some years ago such advertisements were numerous. Nearly all the garment-dyeing machinery has been based on the paddle system, the goods and the liquor being kept in circulation around a circular or oval tub by means of a rotating paddle wheel. As there is so much variation in the size and shape of the garments, trouble is usually encountered due to tangles, tears and heat wrinkles.

Consequently, to-day the nearly universal method of garment dyeing is by poling. The vats used are copper-jacketed kettles, the liquor heated by indirect steam or in wooden tubs usually equipped with a false bottom and heated by a perforated steam pipe. In many plants copper-jacketed kettles are used for fancy shades, and after the dyeing is completed the liquor is discharged into the sewer. Wooden tubs are used for the standard shades, for which a standing bath is kept, additions being made as necessary. The well-cleaned and wet-out garments are entered into the tub and poled with care for the necessary period to attain the desired results. For dark shades this usually requires an hour. When the dyeing is completed, the goods are well rinsed in clean water and finally in a

cold concentrated salt bath or a moderately strong acetic acid bath to set the color.

After hydroextracting they are sometimes steamed to prevent wrinkles and shrinking in drying. They are then hung on hangers to dry in a room in which the temperature is not too high.

One of the very important features of the job follows—i. e., finishing. By intelligent use of the proper equipment, shrinkage can be considerably rectified and the garment restored to a condition comparing favorably to that in which it was first received from the store or manufacturer.

Sulphur Dyeing in the Presence of Celanese*

Eliminating Dyeing Difficulties—Why Sulphur Colors Were Required—Their Application—Suitable Colors —Resist Dyeing

By HARRY PRICE

American Cellulose & Chemical Manufacturing Company, Ltd.

UNDOUBTEDLY the majority of you present this morning have come into contact in one way or another with Celanese. Although it is the most recent of textile fibers it has already made its influence felt in almost every branch of the textile trade, and its properties and advantages are probably well known to you.

Celanese, unlike other types of so-called artificial silks, is not a form of regenerated cellulose. It is composed of cellulose acetate and it is owing to this difference in chemical composition that it varies so much from other artificial fibers in its distinctive and valuable properties. It cannot be looked upon merely as a substitute for natural silk, but should be considered as a new textile fiber of extraordinary usefulness and decorative value.

The manufacturers of Celanese maintain extensive chemical research laboratories and exert every effort to keep a pace ahead of the stringent requirements of the discriminating American public.

With the development of the SRA and other special dyestuffs for dyeing Celanese, the difficulties which were at the start encountered in the dyeing and finishing, have been almost entirely eliminated, and to-day hundreds of dyehouses throughout the country are handling this fiber with the same ease and facility as the older and more familiar fibers.

As indicated by its chemical composition, Celanese is acidic in nature, and consequently is easily attacked by alkalies, especially caustic alkalies, being hydrolized to form regenerated cellulose. Therefore, it is important to insure that caustic alkalies should be excluded from all processes through which it passes. Ammonia should be considered as the safe alkali to use, although soda ash to the extent of 2 per cent on the weight of the Celanese can be employed under careful supervision.

*Paper presented at the meeting of the American Chemical Society, Richmond, Va., April 14, 1927.

Early in the history of Celanese dyeing it became evident that dyes which dyed cotton had little or no affinity for Celanese, and conversely, colors which dyed Celanese did not stain cotton appreciably. The same phenomenon holds good to a slightly lesser extent for wool and real silk, and immediately there arose great possibilities of achieving cross-dyed effects from the one-dye bath. These possibilities undoubtedly account to a certain extent for the immediate appeal that Celanese made to the manufacturers of cotton fabrics.

Why Sulphur Colors Were Required

For a time the dyer handling Celanese-cotton fabrics was limited to the use of direct colors, or to a lesser extent, basic colors for the cotton. It was realized, however, that these two classes of colors did not have the resistance to color destroying agents to meet the insistent demands for guaranteed light-fast or washable colors and persistent research work resulted in the manufacturers of Celanese putting into the hands of the dyers some months ago methods for dyeing with the vat colors in the presence of Celanese. Thus the problem of fast-to-light dyeings has been satisfactorily disposed of.

Research work was then concentrated on fast-to-washing colors for the cotton component. The range of SRA colors produces shades which are quite fast enough for this purpose when applied to the Celanese component, but trouble has been experienced with the cotton colors.

The dyestuffs which would normally be used for the fast-to-washing shades on cotton are the sulphur colors, but formerly it was not considered feasible to apply them when Celanese was present because the sodium sulphide used for the sulphur colors had a deleterious action on the Celanese fiber, causing a certain amount of saponification and consequent staining of this fiber.

It has now been definitely determined, however, that

with many of the sulphur colors the amount of sodium sulphide can be reduced very materially, and that when the following method is used cotton can be dyed with sulphur colors quite satisfactorily in the presence of Celanese. As in the case of other classes of colors, special individual ones must be chosen which have the property, when applied by this method, of leaving Celanese unstained.

Scouring and Bleaching

Suitable pretreatments for mixed goods containing Celanese have been published by the American Cellulose & Chemical Manufacturing Company, Ltd. The normal scour is as follows:

2.5 gram per liter olive oil soap
2.5 c.c. per liter Celascour
1 to 2 c.c. per liter ammonia 20 per cent.

In soft water at 75 deg. Cent. for from 45 minutes to 2 hours, depending on the nature and condition of the fabric.

Celanese is often for convenience doubled with bleached cotton, which obviates the necessity for a drastic scour, but where the foregoing scour has been given, if necessary (as for clear shades), a hypochlorite treatment may be given as follows:

0.25 deg. Tw. solution of sodium hypochlorite for one hour cold. The hypochlorite may be neutralized or slightly acidified with acetic acid or the scouring may follow in a separate bath.

An alternative shorter method is to add about 2½ c.c. per liter of a 50 deg. Tw. solution of sodium hypochlorite to the soap bath (in which case the ammonia should be omitted) when the bleaching will proceed at the same time as the scouring. An antichlor treatment should then be given with 0.5 to 1 gram per liter bisulphite of soda for 15 minutes, cold, followed by rinsing to remove excess bisulphite.

Suitable Sulphur Colors

The following sulphur colors of American manufacture have been carefully tested and found satisfactory for use by this method:

American Aniline Products, Inc.—
Sulphur Deep Black J
Sulphur Navy Blue 3B Conc.
Sulphur Brown R Ex.
Sulphur Golden Brown 2RV
Sulphur Olive Brown 2G
Sulphur Dark Brown R
Sulphur Bordeaux 3B
Sulphur Yellow RS
Sulphur Yellow 2R

E. I. Du Pont de Nemours & Co.—
Sulphogene Carbon H Conc.
Sulphogene Cutch O
Sulphogene Golden Brown C
Sulphogene Bright Green 4GX
Sulphogene Green M
Sulphogene Bordeaux BR
Sulphogene Yellow GG

National Aniline & Chemical Company, Inc.—
Sulphur Black BG Ex. Conc.
Sulphur Black R
Sulphur Brown 4G
Sulphur Brown CG
Sulphur Brown 2G
Sulphur Green GG
Sulphur Bordeaux R
Sulphur Yellow GR

Newport Chemical Works, Inc.—
Sulphur Brilliant Blue BGL
Sulphur Brown RD
Sulphur Brown RN
Sulphur Brown GN
Sulphur Tan 2RN
Sulphur Tan YS
Sulphur Olive GG
Sulphur Olive RN
Sulphur Bright Green GL
Sulphur Bright Green 2B
Sulphur Bordeaux R
Sulphur Violet 2R
Sulphur Yellow CG
Sulphur Yellow G Ex.

The method of solution of the sulphur colors is as follows:

For 3 parts of sulphur dyestuff (100 per cent power) are required:
2 parts of sodium sulphide (rock) or
4 parts of sodium sulphide (crystals)
2 parts of sodium hydrosulphite
and an amount of Celascour necessary to give a concentration in the dye bath of from 1 to 10 c.c. per liter.

Wet out the color with a small proportion of the Celascour and a sufficient quantity of water and then add the sodium sulphide. The temperature is then raised to 85 to 90 deg. Cent., and when all the sulphide is dissolved, the sodium hydrosulphite is added and the liquor stirred gently until the color is entirely dissolved. The bath is set with the remainder of the Celascour and the dyestuffs solution filtered in. If this method is adhered to the bath should remain in good condition throughout

(*Continued on page 294*)

Synthetic Wool

Not a Synthesized Wool—Treatment of Cotton with Acids—Bosshard's Method—A Spun Fiber

By Dr. A. Ganswindt

(Translated from Leipziger Monatschrift fur Textil-Industrie)

THERE has recently appeared in the American technical literature the term "synthetic wool." This is to be regretted, as it may lead those who are less acquainted with the substance to believe that it is a wool prepared by synthetic methods—that is, the synthesis of the keratin molecule—built up in the same manner as the alizarine and Indigo syntheses. The term "cotton wool" has also appeared; that is, a material prepared from cotton and in many respects similar to wool. Therefore, we are not discussing a synthetic wool but a transformed cotton.

That cotton, depending upon the nature of the treatment, readily undergoes changes has been known for eighty years, as Mercer observed by the action of concentrated sulphuric acid on cotton, thereby producing a parchment effect. This observation was later introduced into practice and led to the production of parchment paper. This change in cotton through treatment with cold concentrated sulphuric acid was later discussed by other authors; for example, by Guignet (Comptes Rendues 108, p. 1258) and by Blendel (Bull. Soc. Ind. Rouen 1882, pp. 438, 471). With these facts as a basis, Heberlein proceeded to determine exactly the action of sulphuric acid, and his remarkable results were brought to light through the large number of patents granted him in various countries. A further discussion of this would lead us in too deeply; it is sufficient to say that sulphuric acid of 51 deg. Be. and higher has an entirely different action on cellulose than acid below 51 deg. Be., the latter strength having a more intensive action, and gives the cotton entirely new properties, especially if the cotton has been previously mercerized, since in this condition it is more susceptible to the action of the acid.

If cotton, previously well bleached and mercerized, is allowed to react with sulphuric acid of 40 to 50.5 deg. Be, the luster of mercerizing disappears, and in place of the transparent effect obtained with acid of higher concentrations the fabric takes on the general character of a thin, wool-like material; that is, it appears thicker, fuller and softer. This desirable effect was introduced by Haberlein.

Bosshard's Method

Mercerized cotton treated with sulphuric acid of a concentration over 50.5 deg. Be. produces transparent effects of varying degrees, depending upon the length of treatment, and the repeated treatment with caustic soda and sulphuric acid; but this does not come within the scope of this article.

Results similar to those of Heberlein were obtained by Professor Bosshard, who not only employed sulphuric acid but also nitric acid 42.3 deg. Be., or cooled hydrochloric acid specific gravity 1.19, or with a solution of zinc chloride 66 deg. Be. at temperatures of 60 to 99 deg. Cent., or with a solution of nitro-sulphuric acid cooled to a temperature of zero to —5 deg. Cent. Bosshard obtained parchment as well as wool effects that are similar or approach those obtained by the Heberlein process. His process for producing a wool effect is described in U. S. Patent 1,400,016; he uses a mixture of equal volumes of sulphuric acid 56.5 deg. Be. and nitric acid 40 deg. Be. The cotton fabric becomes denser and has a woolen appearance.

A similar effect has been obtained by Charles Schwarz, of France, according to U. S. Patent 1,400,380, whereby cotton fabrics are treated with strong sulphuric acid in combination with starch. The process is somewhat complicated in operation. In simplified form it appeared in E. P. 144,563 by Gillet et Fils and Charles Schwarz. Cotton is impregnated with a solution of cellulose in nitric acid of 65 per cent or more and the nitrated cellulose is precipitated with dilute solutions of acids, bases or salts. It is then washed in water. A second U. S. Patent 1,400,381 describes the application of casein and other nitrogenous substances in combination with nitric acid. By means of these treatments the cotton assumes the physical properties of wool in regard to appearance, feel and heat conducting, as well as the chemical properties of the animal fiber in its affinity for dyestuffs.

A Spun Fiber

By a process entirely different from the preceding, the Glanzfaden Aktiengesellschaft produces a wool-like spun fiber. The process is described in E. P. 135,206, 152,349 and 152,350. According to the first patent, the wool substitute possesses the luster of the finest qualities of wool and is as strong and has the same wearing qualities as real wool. The method employs solutions of wood cellulose, produced in the usual way and spun like artificial silk. This cellulose solution is spun from large spinnerettes with several hundred openings and wound on large reels. A single spinnerette in this manner can produce 20 kilograms of wool substitute every twenty-four hours. The material is freed from chemicals by means of suitable solutions. The other two patents are modifications of the first. It is known that cellulose which is not boiled during the above preparation is already sufficiently reduced so that it is possible to forego the usual twelve-hour hydration, and in this case the spun material is stronger and has the appearance of wool. It has also been found that the cellulose must not contain more than double its weight of caustic soda, thereby preventing an excess of the latter, which is not chemically combined with the cellulose.

INVESTIGATIONS IN COLORIMETRY

Research Results Published—Work of the Associates —Value of Apparatus Used in Tests

For about four years the Munsell Research Laboratory (Baltimore, Md.) has been co-operating with the Bureau of Standards in colorimetric research.

The objective of this co-operative investigation is the establishment of the fundamental standards and data of colorimetry on a secure scientific basis. It is concerned largely with the psychophysical data of vision: Neutral stimulus ("white light"), brilliance (value) sensibility, hue sensibility, saturation (chroma) sensibility, the three elementary excitations, methods of observing and computing dominant wave length and purity, and the relations between these variables and hue and saturation. The nature of these problems has been indicated in the Appendix to B. S. Scientific Paper No. 417 (August, 1921).

In order to further this work the Munsell Laboratory has maintained a number of research associates who have worked at the bureau on various phases of this investigation.

As a result the following papers have been published:

1. Priest: "The colorimetry and photometry of daylight and incandescent illuminants . . . ." Journal Optical Society of America and Review of Scientific Instruments, vol. 7, pp. 1175-1209; 1923.

2. Priest, McNicholas, and Frehafer: "Some tests of the precision and reliability of measurements . . . by the Koenig-Martens spectrophotometer." J. O. S. A. and R. S. I., vol. 8, pp. 201-212; 1924.

3. Priest: "Apparatus for determination of color in terms of dominant wave length, purity, and brightness." J. O. S. A. and R. S. I., vol. 8, pp. 173-200; 1924.

4. Priest, Tuckerman, Ives, and Harris: "The computation of colorimetric purity." J. O. S. A. and R. S. I., vol. 9, pp. 503-520; 1924.

5. Priest: "The computation of colorimetric purity. II." J. O. S. A. and R. S. I., vol. 13, pp. 123-132; 1926.

6. Judd: "The computation of colorimetric purity." J. O. S. A. and R. S. I., vol. 13, pp. 133-154; 1926.

7. Gibson and Harris: The Lovibond Color System. I., A Spectrophotometric Analysis of the Lovibond Glasses. B. S. Scientific Paper.

In addition, the following abstracts give data or information which have not, as yet, received more adequate publication in complete papers:

1. Priest and Cottrell: "The effect of various conditions upon the determination of the normal stimulus of gray." J. O. S. A. and R. S. I., vol. 7, p. 73; 1923.

2. Priest: "Preliminary data on the color of daylight at Washington." J. O. S. A. and R. S. I., vol. 7, p. 78; 1923.

3. Priest: "Apparatus for hue sensibility and visibility of energy." J. O. S. A. and R. S. I., vol. 7, p. 99; 1923.

4. Priest: "Special apparatus for determination of normal stimulus of gray with full field illumination." J. O. S. A. and R. S. I., vol. 7, p. 100; 1923.

5. Priest, Gibson, and Munsell: "A comparison of experimental values of dominant wave length and purity with their values computed from the spectral distribution of the stimulus." J. O. S. A. and R. S. I., vol. 8, p. 28; 1924.

6. Priest, Gibson, and Harris: "Measurements of illumination and color temperature at Washington during solar eclipse, January 24, 1925." Phy. Rev. (2), vol. 25, p. 901; 1925.

7. Priest, Gibson, and Harris: "Determination of the time of a solar eclipse from measurements of relative illumination." Phy. Rev. (2), vol. 25, p. 902; 1925.

8. Priest: "Gray skies and white snow." J. O. S. A. and R. S. I., vol. 11, p. 133; 1925, and J. Wash. Acad., vol. 15, p. 306; 1925.

9. Priest: "Standard artificial sunlight for colorimetric purposes." J. O. S. A. and R. S. I., vol. 12, p. 479; 1926.

10. Priest: "An experiment bearing on the adoption of a standard neutral stimulus in colorimetry." J. O. S. A. and R. S. I., vol. 13, p. 306; September, 1926.

11. Priest and Brickwedde: "Minimum perceptible colorimetric purity." J. O. S. A. and R. S. I., vol. 13, p. 306; September, 1926.

12. Priest: "Blue sky and white snow." J. O. S. A. and R. S. I., vol. 13, p. 308; September, 1926.

13. Priest and Gibson: "Apparatus for the determination of the visibility of energy and the fundamental scales of visual psychophysics." Eleventh Annual Meeting, Optical Society of America.

14. Tyndall: "Sensibility to wave length difference as a function of purity." Eleventh Annual Meeting, Optical Society of America.

15. Priest and Judd: "Sensibility to wave length difference and the precision of measurement of dominant wave length for yellow colors of high saturation." Eleventh Annual Meeting, Optical Society of America.

16. Priest: "An experiment on color discrimination under commonplace conditions." Eleventh Annual Meeting, Optical Society of America.

The Work of Research Associates

Of the more important results of these past four years has been the development and organization of the facilities for such research, so that the time and effort of a research associate may now be concentrated on his specific problem instead of being dissipated on mere preliminaries.

Temporary associates, having sufficient familiarity with the subject, are thus enabled to obtain definite valuable results in a relatively short time. For example, during the past summer Prof. E. P. T. Tyndall, of the Univer-

sity of Iowa, spent twelve weeks of his vacation here, studying "sensibility to difference in wave length as a function of purity." This is a colorimetric problem of great importance. As a result of those twelve weeks Professor Tyndall has made a valuable contribution to knowledge. His results were communicated to the Optical Society of America at its meeting in Philadelphia, October 21, and will be published shortly. This achievement was possible because standardized apparatus, unusual laboratory facilities and the advice of permanent members of the staff were at his disposal. The preparation of the apparatus which he used was, however, a matter which had occupied years rather than weeks. This apparatus was also described at the current meeting of the Optical Society. ("Apparatus for the determination of the visibility of energy and the fundamental scales of visual psychophysics.") It provides the means for attacking in a systematic and unified manner several of the most fundamental problems of colorimetry. In an extensive program of determining the visual sensibilities the advantage of having one standard apparatus will be apparent to all who are acquainted with the elaborate calibrations and instrumental corrections incident to such work. Sporadic attempts at this kind of research are bound to be ineffective and wasteful of time and effort, and it is thought that much can be accomplished by coordination of the separate problems into a unified program.

Nature of Apparatus Used

Apparatus for the determination of color in terms of dominant wave length and purity (J. O. S. A. and R. S. I., Vol. 8, pp. 173-200; 1924) permanently installed at the bureau is another example of results attained by this cooperative work. This apparatus has now been in use for over three years, and it provides the ready means for undertaking a great deal more fundamental research.

The development of methods and instruments for color grading incandescent illuminants and the various phases of natural and artificial daylight was, in point of time, the earliest result of these co-operative investigations. (J. O. S. A. and R. S. I., Vol. 7, pp. 1175-1209; 1923.) For this purpose two instruments—(1) the "rotatory dispersion colorimetric photometer" and (2) the "blue wedge colorimetric photometer"—have been designed at the bureau and constructed in its instrument shop. The methods of using these instruments have been thoroughly tested and standardized. Since they provide the means for standardizing the color of sources of light, they are of great service in all of the psychophysical investigations. In fact, standardization of sources in terms of "color temperature" is now accepted as an indispensable preliminary in most psychophysical experiments in vision.

It is thus seen that, through the co-operation of the Munsell Laboratory, the bureau is now in possession of unique equipment and facilities for the prosecution of research in visual psychophysics and colorimetry.—Technical News Bulletin of Bureau of Standards.

NOTE ON IDENTIFICATION OF SULPHURIC ACID DAMAGE ON TEXTILES

By F. H. Guernsey
Chief Chemist, Cowles Detergent Company

SULPHURIC acid sour, or sulphuric acid contamination by any means will destroy cotton or linen fabrics if allowed to remain in contact with the goods for a reasonable length of time, or if allowed to dry in the goods.

In examining damaged textiles to determine the cause of damage, chemists, in search of possible sulphuric acid damage, usually apply the "barium chloride test."

In the presence of soluble sulphates or sulphuric acid, barium chloride precipitates the white barium sulphate, insoluble in hydrochloric acid.

Often the amount of precipitate obtainable is very small and confirming tests are difficult.

Chemists often acquire a habit of accepting the appearance of a white insoluble precipitate as evidence of the presence of the sulphate ion.

Impurities, either accidental or incidental, may deceive the chemist. For instance, the presence of traces of silico-fluoride sour will produce a similar precipitate, insoluble in hydrochloric acid. Traces of soap, or soap-like materials will form insoluble barium soaps, which when treated with acid, will partially decompose, setting free the fatty acid constituent which, as a fine white stable emulsion, is easily mistaken for barium sulphate. These conditions are not altered by the order in which the reagents are added.

Reliable micro-chemical methods, involving the crystallization of characteristic calcium and silver sulphates, are available for direct detection or confirmation.

A METHOD TO DISTINGUISH VISCOSE FROM CUPRAMMONIUM RAYON

Rayon, the manufactured fiber which is gaining such a prominent place in the textile field, is actually produced by one of four different processes. How to distinguish the product of each of these processes, although of little importance to the ultimate consumer, is a primary consideration with the textile manufacturer. The properties, especially three of these types, are essentially the same, but the little differences may cause the manufacturer a great deal of trouble in handling, dyeing, etc.

Conclusive tests for the acetate and nitrocellulose types are fairly well established and are proving to be entirely satisfactory. The acetate type is soluble in acetic acid and in acetone; this is not true of the regenerated rayons —nitrocellulose, viscose and cuprammonium. The nitrocellulose type may be identified by the distinctive dark blue color to which it changes when treated with a sulphuric acid solution of diphenylamine.

A simple and satisfactory test that will differentiate between viscose and cuprammonium types has not as yet

been generally accepted or approved by the rayon industry. A positive test to differentiate between viscose and cuprammonium requiring a minimum of technique and of time has been developed. This test is outlined as follows:

Subject 5 g. of the unknown sample of rayon (viscose or cuprammonium) to the action of 100 c.c. of water plus 3 c.c. glacial acetic acid for a period of four hours in a diaphragm flask. The diaphragm consists of a filter paper, which has been saturated with 10 per cent solution of lead acetate, securely fastened on the flange of the flask. If at the end of the four-hour period the exposed part of the lead acetate filter paper covering the flask becomes stained with a brown or a black color, the rayon in question is viscose rayon; if no coloration is obtained, the sample is cuprammonium.

If, for any reason, this single test seems insufficient, verify the results by following the above treatment with the addition of 3 c.c. of concentrated sulphuric acid to the flask containing the sample of rayon, fitting fresh lead acetate filter paper in place and heating the flask for another four hours on a steam bath. In this case a coloration or darkened lead acetate paper will be conclusive evidence that the sample is viscose rayon. If the sample is cuprammonium rayon there will be no coloration on the lead acetate paper.—Technical News Bulletin of the Bureau of Standards.

Practical Hints on the Production of Bright Colors on Textile Fabrics

Part XXVII

A Stripe Spraying Machine—Its Operation and Features—Special Advantages—Dyeing and Topping in One Run—Operation of the Plant—Features and Advantages

By RAFFAELE SANSONE

CERTAIN garments require the production of many stripes running across the surface of the cotton fabrics, and these cannot always be conveniently produced in the weaving. For achieving this effect a plant constructed on the principle shown in Fig. 1 offers special advantages.

This is constituted of a long iron table (K), slightly above the width of the broadest cotton piece to be treated and fixed firmly to the flooring of the dyehouse. On this table is placed a perforated endless band (E), preferably of cotton netting, covered with a thick India rubber coating and held between cylinders P and Q, which are driven by pinion wheels (S), also driving bushes in which are fitted the ends of a winding-on beam (M).

The cotton fabric (F) is unwound in this instance from a wooden beam (N), the end shafts of which are held in position by special supporting brackets that are also furnished with brakes to prevent the slipping of the beam and to keep its material under the required tension.

Above table K is placed a long copper-plated iron cover O, having at the top a tube leading to a small apparatus at the back of the plant that generates air above 110 deg. Cent. Below this cover, table K contains several holes leading to a small pump, driven by an electric motor, that leads the hot air and vapors produced to a condensing plant to bring them into liquid form.

At one end of table K are placed four square copper tanks (A, B, C, D), each of which has fixed to its bottom three distribution tubes with taps and sprayers. Tanks A, B, C, D rest on a light iron stand above the table, and are closed by heavy copper-plated iron covers.

Operation of the Plant

For conducting work on the above plant, four different solutions of dyestuff matter are entered in troughs A, B, C, D, the covers of these being raised just sufficiently to allow the descent of the liquid they contain. The solutions are prepared in preference with volatile solvents, such as alcohol, benzine, etc. Hot air is next generated in the apparatus at the back of the plant, delivering this below cover O and through the openings on the top of the table.

Once the coloring fluids are prepared, the sprayers are taken from below the distribution tubes and cleaned carefully by passing through a long needle, if necessary. When this has been accomplished, a short piece of white waste cotton cloth is sewn to the first roll of cloth to be treated, entering the beam of the latter between the brackets at one side of table K.

The end of the waste piece is then fixed just below the spraying device of band E, opening the taps below cases A, B, C, D for one-half and starting the machine. The

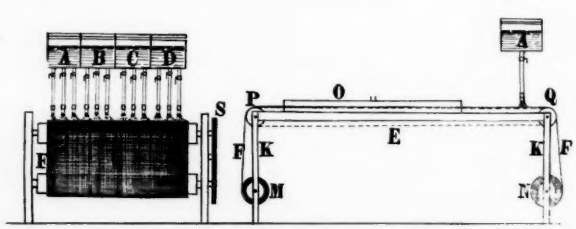

FIG. 1

sprayers now begin to function, depositing stripes on the waste piece of cotton cloth. The colorist then observes if the desired effects have been produced, and if this is not the case the taps on the distribution tubes are opened further or closed somewhat.

When the proper effects are produced, the colorist lets the machine run further. In this way the fabric to be treated passes below the sprayers and four long stripes or twelve narrower stripes, as may be required, are produced over its whole surface, the difference being brought about by increasing or reducing the intensity of the sprays. As the colored material makes its way below cover O, it comes under the action of the hot air, circulating rapidly in this and through the openings in the table top, which brings all the solvent to the condensing apparatus, where it is recovered ready for use again.

Yard after yard of cotton cloth is sprayed and dried in the above manner, and by the time it reaches the winding-on beam M no crocking can occur, the pieces being ready for the finishing operations. When a certain number of yards of cloth have run through the machine, the colorist adds more bath in the four troughs (A, B, C, D), and when the last piece is entering stops all additions of coloring bath.

As one roll of cloth has been entered almost completely, its end is joined to the beginning of a second roll, if this is to be treated in the same way and with the same colors. Should this not be the case, an uncolored waste cotton piece is sewn between the end of the piece nearly complete and the beginning of the new lot, and the machine is stopped just as the beginning of the waste piece passes out of the drying apparatus O. After this, the four troughs (A, B, C, D) are rapidly cleaned and the new coloring baths that are to be used are entered, repeating the trials previously conducted to fix the spray intensity in each case.

Advantages of the Plant

Some of the advantages of the above plant can be enumerated as follows:

1. The cotton cloth goods can be sprayed with the same color, or with two, three or four different colors.

2. Four broad stripes can be produced over the surface of the fabric, closely placed, without the colors blending or with these covering for ½ inch or more the neighboring colors, or with the stripes at a small interval apart from one another, the ground showing through in the spaces thus left free.

3. Four groups of three thin stripes can be produced on the fabric, each of a different color, or of one, two, three or four colors.

4. Effects can be obtained having one, two or three broad stripes with three, two or one lot of three stripes respectively.

5. The thin stripes in each lot can be of different depth of shade, being all three distinct from one another, or two forming a single stripe.

6. If the four troughs are given a zig-zag or a wave movement, the lots of three stripes, or the thick stripes by themselves, or alternated with lots of thin stripes, can be made to form a zig-zag or wave movement down the surface of the cloth.

7. Through the hot-air treatment of the sprayed fabric most of the solvent is recovered within a short period of time, and very little makes its way into the chamber of treatment.

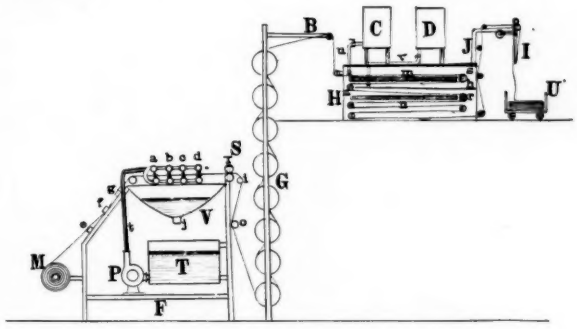

Fig. 2

8. The use of the perforated endless band E assures a better distribution of the cloth during the treatment, without stopping in any way the passage of the heated air.

Dyeing and Topping in One Run

With some classes of cheap cotton cloth goods it would be advantageous to conduct the dyeing and topping in one run, with the idea of economizing on time, space, dyestuff, labor, steam and motive power. For the purpose many plants are at present available where the dyeing with direct colors is conducted on continuous machines and the topping takes place on the padding machine or through spraying. Greater advantage would, however, undoubtedly be possible in some cases by using a plant constructed on the principle shown in Fig. 2.

Here is to be seen a direct color dyeing machine of entirely new type where the dye bath is caused to reach the cotton cloth goods while these are running slowly forward in a fully spread condition from an upper and lower series of copper sprayers (a, b, c, d), being used repeatedly in a very strong concentration. In this way, on choosing from the start the most suitable colors it is possible to dye the material in shades of sufficient intensity for many purposes, which after the topping acquire superior brilliance.

A lower copper-plated iron color trough (T) is furnished, raised from the flooring of the works on the light iron frame F. This has at one side a small centrifugal pump P, so constructed that one of its sides can be taken away when it is necessary to clean the inside.

Pump P has at its top a copper tube t leading upward to a semi-circular tube holding the four pairs of sprayers (a, b, c, d), below which is placed a bell-shaped collector V having at the bottom a broad collar (j), through which

all liquid falling down during the spraying operations collects into trough T.

In front of the sprayers is placed a guide roller and the three opening and spreading bars e, f, g that receive the cotton cloth from a beam (M), fitted with the short end-shafts revolving in well-lubricated bushes on frame F. At the back is a pair of light squeeze rollers (S) which press back into trough V all excess of dye bath, delivering the goods after this to guide rollers i and o and to the bottom of the eight drums G, which dry the material, just leaving a small percentage of moisture. Above drying cylinders G are placed the short projecting arms B that deliver the material to an upper and a lower guide roller which lead it into the topping plant.

This consists of a large copper-plated iron case H, the interior of which contains two hollow plates (m and n), heated through hot air, and a separation partition h. The cloth is run over guiding rollers s, z, r and others so as to pass just above the heated plates m and n, its reverse surface coming in contact with heated plate m and its top with heated plate n.

At the back of heater H are placed four guide rollers which lead the cotton cloth on projecting arms J, where the plaiting disposition I forms it into pieces of any desired width on hand-truck U. A tap (u) is connected with a color liquid trough (C), and has a tube and a long sprayer exercising its action on the front of the cotton fabric, while a second sprayer, fitted to the end of a second tube and tap v, treats the back of the cloth with color liquid from trough D.

To facilitate the drying operations, plates m and n are charged with air heated above 110 deg. Cent., and a powerful pump, worked through a small electric motor, absorbs all vapors formed, which are conducted to a condenser which re-forms them into liquid.

The plant is supplied with a double motion, through which it can be driven continuously throughout the treatment of the lot of cloth or can be driven so as to move and stop alternately, the length of the intervals being regulated in seconds by a special arrangement; or can be moved forward a regulated space, stopped for the coloring an interval, moved forward another interval, during which all supply of topping fluid is stopped, repeating the different operations automatically until the end of the lot being treated.

Construction and Operation of the Plant

Work on the above plant is varied in accordance with the class of goods to be produced. In those cases where a simple dyeing with direct colors and front and back topping is required with basic dyestuffs, a strong bath is prepared with the first in the calculated quantity necessary for the dyeing of the lot to be treated, simultaneously with two solutions of the basic colors that are placed in troughs C and D.

A waste piece of cotton cloth is then passed through the plant so that one end goes just beyond the plaiting device I and the other end remains a few yards beyond the opening and spreading bars e, f, g. This piece is then sewn to the beginning of the first roll of pieces to be dyed and topped and wound above this, keeping under the required tension. Care is taken that the waste piece is entered perfectly straight and smooth, the same precaution being adopted with all pieces to be treated.

The material once entered, pump P is started for observing how the coloring matter solution is distributed on the surfaces of the waste piece by sprayers a, b, c, d, and if this proceeds correctly the topping baths are caused to operate in the interior of heater H by opening taps u and v, the hot air is entered in the hollow plates (m and n), and the pump already indicated is started to create a partial vacuum in the interior of the heater.

The above operations completed, the machine is started so that it stops for a fixed interval and moves for the same interval, alternately. The colorist then observes how the waste cotton piece is colored by the direct dyestuff, regulating the pressure to be applied on squeezing rollers S; noting, also, how drying takes place on the piece. He also observes how the undyed cloth comes from the topping apparatus (H); that is, if the sprayed effect has been accomplished to the desired degree on both sides of the piece, and if it has dried completely on the same.

If the dyeing with the direct colors results satisfactorily, the operation of the plant is allowed to continue further; otherwise the bath is substituted by a fresh color solution, all work and delivery of the basic coloring matters being stopped. On the other hand, should the spraying with the topping colors result unsatisfactorily in one or both cases, the taps delivering the same are either closed or opened further, in accordance with requirements, to control the new effects produced.

When the separate dyeing and topping are properly carried out, then it is observed if the combined dyeing and topping produces the desired effect. This should nearly always be the case, especially if the colorist has properly controlled the separate operations and has conducted preliminary trials on a small scale with the most suitable colors in the laboratory before attempting any work on the plant.

When the treatment with the direct and basic dyes has been regulated satisfactorily, pump P is stopped until the rest of the waste piece has passed through, being, however, set again at work just before the beginning of the first piece to be dyed and topped has passed below sprayers a, b, c, d. At this point the driving of the plant is regulated to conduct the cloth continuously forward without any intermediate stoppages, to obtain a homogenous dyeing and topping throughout the pieces.

These then pass forward easily, the colorist strengthening the contents in vat T at regulated intervals by the addition of fresh bath and adding coloring liquid to troughs C and D to keep them always filled until the moment when the end of the lot being treated approaches.

(*Continued on page* 290)

Proceedings of the American Association of Textile Chemists and Colorists

The American Association of Textile Chemists and Colorists

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LOUIS A. OLNEY
Lowell Textile School, Lowell, Mass.

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Lowell Textile Junior Section—
Samuel Meeker, Chairman; Bernhardt Glickman, Secretary.

QUESTIONNAIRE FOR ATTENTION OF ALL MEMBERS

The following letter, together with the amendment and questionnaire that follow it, has been sent by the Secretary to all members of the Association:

To the Members of the American Association of Textile Chemists and Colorists:

Enclosed you will find a Questionnaire to which your immediate attention is earnestly requested.

By vote of the Council, all papers to be read at the Annual Meeting must be submitted, at least in outline, to the Council by October 1, 1927, with a statement as to how much time will be required for their presentation. This vote was taken in order that the program of the Annual Meeting might be more definitely arranged at an earlier date. For this reason we ask your co-operation, particularly in regard to Questions 7 and 8.

We believe there are many members of the Association who could present interesting and valuable papers upon various phases of dyestuff application and textile chemistry, and it is more than probable that you may be one of them.

Please co-operate by giving prompt and thoughtful attention to this questionnaire.

Yours very truly,

L. A. OLNEY.

Proposed Amendment to Article VIII

The following proposed amendment to Article VIII was presented at the Annual Meeting held in Charlotte, N. C., and by vote of those assembled at the meeting was passed to Letter Ballot by a decided majority:

Third Paragraph, omit the words "Excepting the first election" to "at least ten nominating ballots," and substitute the following:

Not later than July 1 in each year each Section shall elect one of its members to serve on a committee to prepare nominations for the annual election. The local secretaries shall send the names of their respective committee members to the Secretary of the Association, who shall serve as Chairman of the Committee without vote. The Committee shall publish in the Proceedings of the Association between October 1 and October 15, at least one nomination for each officer and at least two nominations for Councilor. Counter nominations for any office, signed by at least ten members, may be filed with the Secretary not later than November 1. The Secretary shall then prepare and issue an official ballot containing the names of all the nominees.

In accordance with Article XII, you are therefore requested to signify your wishes in regard to the proposed amendment by returning the properly marked attached ballot.

Questionnaire

The following questionnaire is being forwarded to every member of the Association, also a return envelope. Remember, if you wish to be considered a member in the

best of standing, you will fill out this questionnaire to the best of your ability, and return it immediately. *Answers to some of these questions are absolutely necessary for the publication of an accurate Year Book.* Even though you cannot answer all the questions, answer as many as you can and mail it to the Secretary as early as possible.

1. Name .....
2. Home Address .....
3. Name of Company or Employer.....
4. Business Address .....
5. Occupation or Official Designation.....
6. Check the headings in which you are particularly interested: Cotton, Wool, Silk, Linen, Artificial Silk, Union Material.
7. What subjects can you suggest which you believe will be of general interest for presentation or discussion at our Annual Meeting, which will be held in New York City during the first week in December?
8. Will you present a paper in regard to one of these subjects, and if so, which one?
9. Are there any special features in regard to the Annual Meeting you would suggest to make it of greater interest and value to the attending members?
10. Look over the 1926 Year Book and suggest any ways in which you believe it might be made of more value to the readers, or any additions which you would suggest for 1927.
11. Make note of any corrections or additions which you believe should be made to the list of American dyes as published in 1926 Year Book.
12. Make any suggestions you may have in mind in regard to the general activities of the Association, including the work of the Research Committee.
13. Are there any other types of fastness tests which you believe should be added to those already proposed by the Research Committee.
14. Suggest any special sub-committees which you believe could be advantageously appointed to accomplish any specific result.
15. Membership Research Fund: Our Five Dollar Membership dues are small in comparison with those of similar organizations, and do not provide sufficient income to properly carry on the regular activities of the Association, particularly the work of the Research Committee. Rather than increase the dues, a Membership Research Fund was started two years ago, and this, in connection with the returns from Corporate Memberships, have provided for such work as has so far been undertaken by the Research Committee. It is hoped that members will renew their subscriptions to this fund, and, if possible, make additional ones. It has been suggested that in the 1927 Year Book some mark of designation be placed before the names of those who have contributed during the year to the Research Fund.
    Will you contribute towards this Research Fund during the year 1927? If so, how much will you contribute?
    When Payable?
    Will you endeavor to secure at least one Corporate Membership during the year?
    Who would you suggest as prospective Corporate members?
16. During the year 1927, four prizes of $100.00, $75.00, $50.00 and $25.00 have been offered for the best papers or communications published in the Proceedings of the Association. It is hoped that this series of prizes will promote a keener interest and desire to present papers before Local Sections, at the Annual Meeting, and also to forward communications to the Society for publication in the Proceedings.

Deceased

Folsom, Herbert A., 8 Miller Avenue, Providence, R. I.
Hunziker, August J., Arcola, Ridgewood, N. J.
Snowden, Donald G., East Falls, Philadelphia, Pa.

Resignation

Eashlow, Harry I., 997 Main Street, South Manchester, Conn.

ASSOCIATION BADGES

The lapel button badge illustrated herewith is worn by members of the American Association of Textile Chemists and Colorists.

The three "rings" are enameled in red, yellow and blue, respectively, and the initials and border are brought out in gold. The general effect is exceedingly attractive.

Badges may be secured at $1.50 each by addressing the Secretary.

WALTER E. HADLEY,
5 Mountain Avenue,
Maplewood, N. J.

Dyes Imported Through New York and Other Ports During March

Compiled by the Chemical Division of the Bureau of Foreign and Domestic Commerce in Collaboration with the Chemical Division of the United States Tariff Commission

KEY TO ABBREVIATIONS OF MANUFACTURERS' NAMES

1—THE SIX LEADING GERMAN COMPANIES

IG—Interessen-Gemeinschaft der Farbenindustrie.
A—Actien-Gesellschaft fur Anilin-Fabrikation, Berlin. Founded 1873.
B—Badische Anilin-und-Soda-Fabrik, Ludwigshafen-on-the-Rhine. Founded 1865.
By—Farbenfabriken, vormals Friedr. Bayer & Co., Leverkusen-on-the-Rhine. Founded 1862.
C—Leopold Cassella & Co., Frankfort-on-the-Main. Founded 1870.
K—Kalle & Co., A. G., Biebrich-on-the-Rhine. Founded 1870.
M—Farbwerke, vormals Meister Lucius & Bruning, Hochst-on-the Main. Founded 1862.

2—THE SMALLER GERMAN COMPANIES

BK—Leipziger Anilinfabrik Boyer & Kegel, Furstenberg, near Leipzig. Founded 1882.
CG—Chemikaliewerk Griesheim G. m. b. H., Griesheim-on-the-Main. Founded 1882.
CJ—Carl Jager G. m. b. H., Anilinfarbenfabrik, Dusseldorf. Founded 1823
GrE—Chemische Fabrik Griesheim-Electron, Offenbach-on-the-Main. Founded 1842.
L—Farbwerk Mulheim, vormals A. Leonhardt & Co., Mulheim-on-the-Main. Founded 1879
Seig.—G. Seigle Corporation, Stuttgart.
tM—Chemische Fabriken, vormals Weiler ter Meer, Uerdingen-on-the-Rhine. Founded 1877.
WD—Wulfing, Dahl & Co., A. G. Barmen. Founded 1842.

3—SWISS COMPANIES (ALL AT BASEL)

DH—Farbwerke vormals L. Durand, Huguenin & Co. Founded 1871.
G—Anilinfarben-und Extract-Fabriken, vormals Joh. Rud. Geigy. Founded 1764.
I—Gesellschaft fur chemische Industrie. Founded 1885.
S—Chemische Fabrik, vormals Sandoz & Co. Founded 1887.

4—DUTCH AND FRENCH COMPANIES

FA—Farbwerk Ammersfoort, Ammersfoort, Netherlands. Founded 1888
NF—Niederlandische Farben-und-Chemikalienfabrik Delft, Delft, Netherlands. Founded 1897.
CN—Compagnie Nationale de Matieres Colorantes et Produits Chimiques. Founded 1917. (Etablissements Kuhlmann merged with this company in 1923.)
P—Societe Anonyme des Matieres Colorantes et Produits Chimiques St. Denis (formerly A. Poirrier). Founded 1830.

5—ENGLISH COMPANIES

Bro—Brotherton & Co., Ltd., City Chambers, Leeds.
BAC—British Alizarine Co., Ltd., Manchester
BD—British Dyestuffs Corporation, Ltd., London.
Cl Co.—The Clayton Aniline Co., Ltd., Clayton, Manchester.
CV—The Colne Vale Dye & Chemical Co., Ltd., Milnsbridge, Huddersfield.
Hol—L. B. Holliday & Co., Ltd., Huddersfield.
Scot—Scottish Dyes, Ltd., Grangemouth.

COAL-TAR dyes imported through New York and other ports during the month of March totaled 404,714 pounds, with an invoice value of $352,414. Imports by ports were as follows: New York, 372,296 pounds, valued at $324,349; Boston, 20,006 pounds, valued at $19,136; Albany,* 10,876 pounds, valued at $8,044; Philadelphia, 1,008 pounds, valued at $522; Detroit, 528 pounds, valued at $363.

Dyes and Intermediates Remaining in Bonded Customs Warehouse

	Dyes and Colors (pounds)	Intermediates (pounds)
July 31, 1926	512,186	781,796
August 31, 1926	557,852	690,031
September 30, 1926	395,535	590,520
October 31, 1926	281,320	557,257
November 30, 1926	303,321	539,561
December 31, 1926	360,488	562,536
January 31, 1927	615,542	647,692
February 28, 1927	896,059	719,055

*February and March figures.

Imports of Synthetic Dyes

1927—	Pounds	Invoice Value
January	196,620	$186,387
February	312,277	262,364
March	404,714	352,414
Total	913,611	$801,165
1926—		
January	300,441	$283,635
February	369,045	377,638
March	487,804	435,891
Total	1,157,290	$1,097,164

Five Leading Dyes, by Quantity, Imported During March

	Pounds
Ciba Red R Paste	31,524
Vat Yellow G Double Paste (single strength)	11,938
Ciba Violet B Powder (single strength)	11,020
Erioglaucine	10,471
Purpurine	10,000

Per Cent of Dyes by Country of Shipment

	1927		
	March	February	January
Germany	40.0	49.5	37.0
Switzerland	42.0	33.9	34.0
Belgium	4.0	4.9	11.0
England	7.0	4.6	7.0
France	3.0	1.3	7.0
Italy	2.0	0.3	3.0
Canada	2.0	5.3	1.0
Holland	..	0.2	..

Imports of Color Lakes

	Pounds	Invoice Value
January	1,000	$131
February	....	....
March	4,868	3,241

The dyes in this report are grouped by both Colour Index and Schultz numbers, and in the case of those which could not be identified by either number the classification according to the ordinary method of application was adopted. As the pastes and powders of the vat dyes vary widely in strength and quantity, each vat dye has been reduced—in nearly every case—to a single-strength basis.

DYES OF COAL-TAR ORIGIN

Col. Index No.	Schultz No.	Name of Dye and Mfr.	Quantity (pounds)
44	56	Nitrosamine Red Paste—(IG)	500
70	—	Rapid Fast Red GL Paste—(IG)	2,000
114	94	Guinea Fast Red 2R—(IG)	200
165	153	Lake Red C—(Q)	2,240
172	159	Acid Alizarine Black R—(IG)	500
196	175	Acid Ponceau E—(G)	220
219	—	Eriochrome Flavine A Conc.—(G)	2,204
224	193	Stanley Red—(CAC)	55
225	194	Thiazine Red RXX—(IG)	100
307	265	Acid Milling Black B—(G)	2,205
316	273	Diaminogene Blue NA—(C)	661
319	—	Benzo Fast Heliotrope BL—(By)	220
324	—	Developed Brilliant Orange GR Ex.—(By)	110
325	—	Diamine Brilliant Violet 2R—(C)	232
326	279	Benzo Fast Orange WS—(IG)	
		Benzo Fast Scarlet 8BS—(IG)	200
382	319	Chloramine Red B—(S)	
		Chloramine Red 3B—(S)	4,000
430	—	Polar Red G Conc.—(G)	
		Polar Red R Conc.—(G)	6,615
436	358	Chloramine Red 8BS—(By)	666
440	360	Ignamine Orange R—(IG)	100
441	—	Chromocitronnie R—(DH)	441
449	364	Diazo Brilliant Black B—(IG)	1,000
459	373	Congo Orange R—(IG)	500
487	400	Acid Anthracene Red 3B—(IG)	100
516	423	Blue NBB—(IG)	1,323
532	—	Diazo Fast Green BL—(I)	110
577	457	Trisulphon Brown GG Conc.—(S)	3,002
590	471	Polyphenyl Blue GC—(G)	551
636	19	Fast Light Yellow 3G—(IG)	1,500
639	22	Xylene Light Yellow GG—(S)	1,000
645	—	Kiton Fast Yellow 3G—(I)	1,322
652	29	Omega Chrome Red B Conc.—(S)	1,000
653	—	Pyrazol Orange G Conc.—(S)	2,000
658	496	Setoglaucine Conc.—(G)	551
670	505	Light Green SF Yellowish—(IG)	200
671	506	Erioglaucine AP—(G)	
		Erioglaucine EP—(G)	
		Erioglaucine X High Conc.—(G)	10,471
681	516	Crystal Violet Extra—(IG)	
		Crystal Violet P—(By)	800
682	518	Ethyl Violet—(IG)	1,000
690	522	Victoria Blue 4R High Conc.—(IG)	100
691	523	Fast Green Extra Blue Shade Conc.—(IG)	1,500
696	528	Kiton Fast Violet 10B—(I)	110
700	532	Alkali Violet A Extra Conc.—(IG)	50
704	536	Alkali Blue 2B Conc.—(IG)	1,000
706	538	Methyl Lyons Blue—(G)	7,716
707	539	Soluble Blue I Old—(IG)	100
712	543	Patent Blue V—(IG)	2,500
714	545	Carmine Blue A—(M)	
		Poseidon Blue BR Conc.—(IG)	2,028
715	546	Blue FF—(IG)	
		Cyanol Extra—(C)	
		Cyanol FF—(C)	
		Xylene Fast Blue FF Conc.—(S)	2,789
722	553	Eriochrome Cyanine RC—(G)	1,102
723	554	Chrome Azurol S Conc.—(G)	551
729	559	Basic Pure Blue BO—(B)	
		Victoria Pure Blue BO—(IG)	730
735	564	Alkali Fast Green 3G—(IG)	100
749	573	Rhodamine B Conc. (s. s.)—(G)	
		Rhodamine B Extra—(IG)	3,600
756	581	Fast Acid Eosine G—(IG)	20
768	587	Eosine Extra GFF (f. f. s.)—(IG)	20
773	592	Erythrosine Extra—(IG)	50
786	—	Auracine G—(G)	110
787	—	Coriphosphine OX Extra—(B)	100
788	603	Rhoduline Orange NO—(IG)	300
789	—	Patent Phosphine G, GG, R—(I)	2,645
793	606	Leather Yellow GC—(G)	
		Phosphine O, 3R—(IG)	2,600
797	608	Patent Phosphine GRNTN—(IG)	
		Patent Phosphine RRDX—(IG)	3,000
801	613	Quinoline Yellow Extra—(IG)	100
802	—	Quinoline Yellow KT Extra Conc.—(IG)	100
815	618	Basic Yellow T—(IG)	500
833	—	Wool Fast Blue BL—(By)	
		Wool Fast Violet B—(IG)	
		Xylene Milling Blue GL Conc.—(S)	2,421
845	687	Methylene Heliotrope Extra Strong—(IG)	250
873	681	Methylene Gray—(G)	22
875	923	Fur Black DF—(IG)	
		Fur Blue Black SB—(IG)	
		Fur Brown NZ, NZD, P, 2R, 4R—(IG)	
		Fur Brown SK, SO, SP—(IG)	
		Fur Gray AL, ALA, B, G—(IG)	
		Fur Gray Brown SLA—(IG)	
		Fur Olive DA—(IG)	
		Fur Red Brown 6R—(IG)	
		Fur Yellow Brown 2GA—(IG)	
		Fuscamine G—(IG)	
		Nako B, DR, 3GA, RHG—(IG)	3,796
878	622	Brilliant Delphine Blue B—(S)	2,000
884	627	Anthracyanine S—(DH)	
		Chromacetin Blue S Extra—(DH)	881
888	631	Chromocyanine V Paste—(DH)	
		Chromocyanine B Paste—(DH)	22
892	635	Modern Violet—(DH)	661

Col. Index No.	Schultz No.	Name of Dye and Mfr.	Quantity (pounds)
894	637	Gallamine Blue Extra Paste—(G)	7,727
905	645	Gallazine No. 90—(DH)	441
913	653	Danubia Blue BX—(IG)	500
926	661	Thionine Blue G—(I)	551
927	663	New Methylene Blue N—(IG)	1,050
969	748	Hydron Blue R Powder (s. s.)—(IG)	1,667
1019	774	Alizarine Black S Paste—(IG)	470
1027	778	Alizarine Paste Bluish—(I)	
		Alizarine Red VI Extra Pure—(IG)	
		Alizarine Red VI Old—(IG)	4,828
		Alizarine Red SW—(I)	220
1037	783	Purpurine—(IG)	10,000
1054	858	Alizarine Light Blue B—(S)	5,004
1060	801	Anthracene Blue SWG Powder—(IG)	
		Anthracene Blue SWGG—(B)	548
1064	—	Alizarine Cyclamine R—(IG)	2,815
1067	804	Alizarine Blue S Powder—(IG)	860
1071	808	Alizarine Green S Paste—(BD)	363
1073	852	Alizarine Direct Violet ER Powder—(IG)	100
1075	856	Alizarine Blue AS Powder—(Bv)	1,212
1077	860	Alizarine Direct Blue BGAOO—(IG)	500
1084	854	Alizarine Viridine FF Paste—(IG)	
		Alizarine Viridine FF Powder (s. s.)—(IG)	4,470
1088	855	Alizarine Sky Blue B Powder—(IG)	
		Alizarine Blue SKY Powder—(By)	
		Chrome Pure Blue B Powder—(By)	2,480
1091	—	Alizarine Rubine R Powder—(By)	221
1092	—	Alizarine Geranol B Powder—(IG)	500
1095	759	Anthra Yellow GC Paste—(IG)	
		Anthra Yellow GC Powder (s. s.)—(B)	5,382
1097	761	Vat Orange RRT Paste—(B)	
		Vat Orange RRT Paste Fine—(IG)	6,379
1099	763	Vat Dark Blue BOA Paste—(B)	220
1104	767	Vat Violet RR Ex. Dbl. Pst. (s. s.)—(B)	880
1106	838	Vat Blue RS Triple Powder (s. s.)—(IG)	1,200
1109	840	Vat Blue 3G Powder (s. s.)—(IG)	500
1113	842	Vat Blue GCD Dbl. Pst. Fine (s. s.)—(IG)	
		Vat Blue GCDN Powder (s. s.)—(IG)	
		Indanthrene Blue GCD Dbl. Pst. (s. s.)—(B)	6,682
1114	—	Vat Blue BCD Paste Fine—(B)	221
1115	843	Cibanone Blue G Paste—(I)	551
1118	849	Vat Yellow G Dbl. Pst. Fine (s. s.)—(IG)	11,938
1133	819	Algol Red FF Ex. Pdr. (s. s.)—(IG)	
		Algol Red R Ex. Pdr. (s. s.)—(IG)	2,120
1136	822	Vat Orange RRK Paste—(By)	
		Vat Orange RRK Powder (s. s.)—(By)	1,594
1138	810	Helindone Yellow 3GN Powder (s. s.)—(IG)	250
1143	827	Anthra Claret R Powder (s. s.)—(IG)	400
1150	833	Vat Olive B Powder (s. s.)—(By)	
		Vat Olive R Paste—(IG)	3,143
1151	—	Vat Brown R Paste—(IG)	
		Vat Brown R Powder (s. s.)—(IG)	3,745
1152	—	Vat Brown G Paste—(IG)	
		Vat Brown G Paste—(By)	1,832
1162	831	Vat Red RK Powder (s. s.)—(IG)	2,400
1169	792	Cibanone Orange R Paste—(I)	1,102
1172	794	Cibanone Black B Paste New—(I)	1,653
1173	793	Cibanone Blue 3G Paste—(I)	2,314
1178	876	Indigosol O—(DH)	220
1184	881	Brilliant Indigo 4B Paste Fine—(IG)	5,820
1186	883	Indigo MLB 16B Powder (s. s.)—(IG)	2,500
1190	885	Brilliant Indigo B Paste—(IG)	2,533
1196	890	Ciba Yellow G Paste—(I)	220
1207	912	Anthra Red B Paste Fine—(IG)	
		Ciba Pink B Paste—(I)	1,226
1211	910	Vat Pink BN Paste—(Q)	1,278
1212	918	Ciba Red 3B Powder (s. s.)—(I)	
		Thioindigo Red 3B Paste—(K)	
		Vat Red Violet RH Paste—(IG)	7,171
1217	913	Helindone Orange R Paste—(IG)	
		Thioindigo Orange R Powder (s. s.)—(K)	3,100
1218	915	Helindone Scarlet R Powder (s. s.)—(IG)	800
1222	901	Ciba Violet B Powder (s. s.)—(I)	11,020
1227	904	Helindone Brown G Paste—(IG)	1,000
1229	908	Ciba Red R Paste—(I)	31,524
1230	911	Ciba Orange G Paste—(I)	551
1247	—	Bengal Indigo—(I)	1,515

UNIDENTIFIED DYES

Acid Dyes

Name of Dye and Manufacturer	Quantity (pounds)
Acid Pure Blue R Supra—(G)	1,102
Acid Rhodamine BG—(IG)	400
Alizarine Direct Blue RBX—(IG)	75
Azo Wool Blue SE—(IG)	200
Brilliant Wool Blue B Extra—(IG)	100
Brilliant Wool Blue FFB Extra—(IG)	50
Brilliant Wool Blue FFR Extra—(IG)	1,400
Cloth Fast Brown 5R—(I)	441
Cloth Fast Orange R—(I)	441
Erio Fast Brilliant Violet BR—(G)	55
Indocyanine B—(IG)	1,500
Indocyanine FF—(IG)	200
Metanil Red 3B Extra—(IG)	100
Milling Orange G—(IG)	200
Milling Red 6BA—(IG)	200
Milling Yellow GA—(A)	500
Naphthol Black BGN Conc.—(IG)	300
Neolan Blue GG—(I)	3,305
Neolan Yellow R—(I)	220
Novazol Blue B—(G)	1,102
Novazol Violet B—(G)	1,653
Pilatus Fast Orange R—(IG)	50
Polar Orange R Conc.—(G)	2,205
Silk Yellow R—(IG)	250
Sulpho Rhodamine G—(M)	150
Sulphon Yellow R—(IG)	200
Supramine Blue R—(IG)	200
Supramine Bordeaux B—(IG)	700
Supramine Brown G—(IG)	100
Supramine Red B—(IG)	300
Supramine Red 3B—(IG)	730
Xylene Milling Orange R Conc.—(S)	500
Xylene Milling Red B Conc.—(S)	500

Vat Dyes

Alizarine Indigo 5R Paste—(IG)	1,000
Anthra Bordeaux B Powder (s. s.)—(IG)	200
Anthra Orange RH Paste Fine—(IG)	500
Anthra Pink B Extra Paste—(IG)	3,500
Anthra Scarlet B Paste—(IG)	500
Ciba Pink BG Paste—(I)	110
Ciba Violet RL—(I)	88
Cibanone Bordeaux B Paste—(I)	441
Cibanone Red G Powder (s. s.)—(I)	2,205
Eridan Brilliant Scarlet B Paste—(IG)	200
Grelanone Red 2B Powder (s. s.)—(IG)	400
Grelanone Red 3BR Powder (s. s.)—(IG)	1,384
Helindone Printing Black RD Paste—(IG)	5,000
Hydron Brown G Paste—(C)	550
Hydron Brown R Paste—(IG)	397

Hydron Pink FF Paste—(IG)	2,500
Hydron Scarlet 3B Paste—(C)	
Hydron Scarlet 3B Powder (s. s.)—(C)	4,547
Indigosol O4B—(DH)	441
Indigosol OR—(DH)	110
Indigosol Orange HR—(DH)	55
Indigosol Yellow HCG—(DH)	110
Vat Black BGA Paste—(IG)	441
Vat Brilliant Blue 3G Paste Fine—(IG)	100
Vat Brilliant Blue R—(B)	485
Vat Brilliant Orange RK Paste—(IG)	50
Vat Golden Orange 3G Paste—(B)	
Vat Golden Orange 3G Powder (s. s.)—(IG)	1,588
Vat Gray RRH Paste Fine—(IG)	492
Vat Green G Double Paste (s. s.)—(IG)	1,018
Vat Green GG Double Paste (s. s.)—(IG)	996
Vat Khaki GG Paste—(IG)	480
Vat Orange 3R Paste Fine—(IG)	1,076
Vat Pink B Double Paste (s. s.)—(IG)	
Vat Pink B Double Paste Fine (s. s.)—(IG)	993
Vat Printing Brown R Paste—(IG)	1,234
Vat Printing Violet RF Paste—(IG)	200
Vat Red GG Powder (s. s.)—(IG)	800
Vat Red Brown R Paste—(B)	1,394

Mordant and Chrome Dyes

Acid Alizarine Gray G—(IG)	500
Acid Anthracene Brown PG—(IG)	500
Alizarine Brown HD Paste—(IG)	100
Anthracene Chromate Brown EB—(IG)	500
Chrome Violet CBD—(DH)	55
Chromocyanine BC Paste—(DH)	11
Chromorhodine 6GN Extra—(DH)	441
Chromoxane Pure Blue B—(IG)	400
Erio Anthracene Brown R—(G)	440
Eriochromal Brown G Powder—(G)	330
Eriochrome Blue S—(G)	1,102
Eriochrome Brilliant Violet B Supra—(G)	1,102
Eriochrome Phosphine RR—(G)	551
Metachrome Olive 2G—(IG)	500
Modern Blue CVI—(DH)	551
Omega Chrome Brown EB—(S)	500
Oxychrome Brown V—(St.D)	110
Ultra Orange R—(S)	500

Direct Dyes

Benzo Dark Brown Extra—(By)	1,691
Benzo Fast Blue 4GL—(IG)	200
Benzo Fast Bordeaux 6BL—(IG)	100
Benzo Fast Brown 3GL—(IG)	100
Benzo Fast Brown RL—(IG)	400
Benzo Fast Gray BL—(IG)	500
Benzo Fast Heliotrope 4BL—(By)	220
Benzo Fast Light Scarlet 4BL—(IG)	100
Benzo Fast Yellow RL—(By)	220
Benzo Rhoduline Red 3B—(IG)	450
Benzoform Scarlet B—(IG)	100
Brilliant Benzo Green B Powder—(By)	440
Brilliant Benzo Fast Yellow GL—(By)	310
Brilliant Congo Blue 5R—(IG)	200
Brilliant Pure Blue 8G—(By)	2,391
Brilliant Pure Blue R—(IG)	300
Brilliant Pure Blue 2RM—(By)	55
Brilliant Pure Yellow 6G Extra—(By)	
Brilliant Pure Yellow 6G Extra—(IG)	970
Chloramine Violet R—(IG)	50
Chlorantine Fast Green B—(I)	3,307
Chlorantine Fast Violet BL—(I)	441
Chlorantine Fast Violet 2RL—(I)	2,204
Chlorantine Fast Yellow RL—(I)	881
Chlorazol Fast Brown RK—(BD)	511
Developing Blue B—(IG)	500
Diamine Fast Orange ER—(IG)	1,000
Diaminogene Blue GG—(C)	550
Diazo Brilliant Green 3G—(IG)	
Diazo Brilliant Green 3G—(By)	1,402
Diazo Brown 6G—(By)	400
Diazo Brown 3RB—(By)	476
Diazo Fast Blue 6GW—(I)	1,102
Diazo Fast Yellow 3RL—(I)	110
Diazo Fast Sky Blue 3G, 3GL—(IG)	600
Diazol Light Red N8B—(CN)	4,400
Diazophenyl Black V—(G)	2,205
Diphenyl Brown BBNC—(G)	2,205
Diphenyl Dark Green BC—(G)	496
Diphenyl Fast Brown GNC—(G)	2,205
Direct Brilliant Yellow KG—(I)	220
Direct Cutch Brown GR—(I)	2,204
Fast Cotton Gray BL—(IG)	300
Fast Cotton Rubine B—(IG)	100
Formal Fast Black G Conc.—(G)	551
Foulard Discharge Blue B—(IG)	200
Foulard Discharge Green BL—(IG)	100
Minaxo Black BBNX—(IG)	100
Paper Red A Extra—(IG)	1,200
Pluto Brown GG—(IG)	50
Rapid Fast Orange RG Paste—(IG)	1,000
Rosanthrene R—(I)	1,102
Rosanthrene Bordeaux B—(I)	110
Rosanthrene Orange R—(I)	1,323
Sky Blue N—(IG)	100
Solamine Gray VL—(IG)	50
Triazol Fast Brown 3GL—(GrE)	220
Zambesi Black D—(IG)	500
Zambesi Black F—(IG)	500

Dyes for Artificial Silk

Cibacete Orange 2R Paste—(I)	110
Cibacete Orange 3G Paste—(I)	220
Cibacete Red GR Paste—(I)	110
Cibacete Scarlet G Paste—(I)	441
Cibacete Turquoise Blue Paste—(I)	441
Cibacete Violet 2R Paste—(I)	110
Cibacete Yellow 3G Paste—(I)	110
Cibacete Yellow R, 2R Paste—(I)	220
Cellit Fast Red B—(IG)	100
Celliton Blue B Powder—(IG)	50
Duranol Blue G Paste—(BD)	106
Duranol Red 2B Paste—(BD)	212
Ionamine A—(BD)	50

Basic Dyes

Brilliant Acridine Orange R Conc.—(Roh)	285
Rhodamine 6GDN Extra (s. s.)—(IG)	1,000
Rhodamine Scarlet G Powder—(By)	132
Xantho Phosphine GR—(DH)	220

Sulphur Dyes

Katigene Chrome Blue 5G—(IG)	2,151
Suplhur Brown CL/4R—(IG)	500
Thionol Green B—(BD)	9,095
Thionol Yellow GR—(BD)	9,504

Spirit-Soluble and Color-Lake Dyes

Alizarine Astrol Powder (Oil Soluble)—(IG)	100
Hansa Yellow GSA Powder—(IG)	5,000
Hansa Yellow 5G Powder—(IG)	200
Helio Red RMT Extra Powder—(IG)	300

Oil Green ALB Lumps—(IG)	50
Stone Rubine BN, G Powder—(IG)	250
Tero Black FB—(IG)	100
Tero Brown FR—(IG)	25
Tero Red FG—(IG)	25

Unclassified Dyes

Grasol Orange 2R—(G)	11
Grasol Red B—(G)	11
Grasol Yellow 2R—(G)	11
Red Ponceau R—(Q)	441
Utopia Brilliant Green B Conc.—(NBC)	896
Utopia Brilliant Green 6G Conc.—(NBC)	112

LIST OF APPRAISEMENTS OF COAL-TAR PRODUCTS WITHIN PARAGRAPHS 27 AND 28 OF THE TARIFF ACT OF 1922

The following supplemental list contains the month of entry, the name of the product within paragraphs 27 and 28, together with the designations as "C" (for competitive) and "NC" (for non-competitive), which indicates the appraisement basis for the assessment of the ad valorem duty in paragraphs 27 and 28 of the Tariff Act of 1922.

The ad valorem rate for competitive dyes is based on the American selling price, as defined in Subdivision (f) of Section 402 of Title IV; the ad valorem rate for non-competitive dyes is based on the United States value, as defined in Subdivision (d) of Section 402 of Title IV of the Tariff Act of 1922.

This list contains the appraisements received since the publication of the January list for the Port of New York, beginning with October, 1926:

OCTOBER, 1926

Alizarine Rubine R Powder	C
Anthra Rubine 3G	NC
Anthra Yellow GC Powder	NC
Anthracyanine S	NC
Brilliant Acid Blue NAS Surfin	C
Brilliant Wool Blue FFR Extra	NC
Chlorantine Fast Violet 5BL	NC
Chrome Printing Red B	NC
Chrome Violet GC	NC
Ciba Red 3B Paste	NC
Ciba Red 3B Powder 60%	NC
Ciba Red R Paste	NC
Diaminogene Blue NA	C
Diazamine Blue BB Conc	C
Diazol Light Red N8B	C
Gallazine No. 90	C
Indigosol AZG	NC
Indigosol O4B	NC
Indigosol OB	NC
Naphthaline Green V	C
Pyrogene Green CK	NC
Quinoline Yellow	C
Setacyl Direct Blue R Powder 782	NC
Vat Gold Orange G Powder	C

NOVEMBER, 1926

Acridine Scarlet J	NC
Alizarine Red S Powder	C
Blue 1900 TCD	NC
Brilliant Chrome Violet 3RA	NC
Brilliant Sulphon Red 10B	NC
Chloramine Brilliant Red 8B Conc	NC
Chloramine Light Gray B Conc	NC
Chlorantine Fast Brown BBL	NC
Chlorantine Fast Violet RI	NC
Chromazurine DH	NC
Chromazurine C	NC
Chromovesuvine RA	NC
Cloth Fast Yellow G	C
Diazamine Blue BR Conc	C
Kiton Fast Yellow 30	C
Modern Blue CVI	NC
Neolan Green LBN Conc	NC
Rosanthrene Orange R	NC
Vat Blue RS Triple Powder for Paper	C
Vat Golden Orange G Double Paste	C
Vat Yellow G Powder	C
Xylene Cyanole FF Extra Conc	NC
Xylene Fast Blue FF Conc	NC

DECEMBER, 1926

Alizarine Blue AS Powder	NC
Alizarine Sapphire Blue SE	NC
Anthra Scarlet 2G Paste	NC
Brilliant Chrome Blue S	NC
Chlorantine Fast Orange R Conc	C
Chlorantine Fast Blue 2GL	C
Chromacetine Blue S Extra	NC
Chromazurine G	NC
Chrome Printing Red Y	NC
Chromorhodine 6GN Extra	NC
Diamine Azo Fast Violet R	C
Diazamine Blue BR Conc	C
Gallazine No. 90	NC
Indanthrene Blue GCD Double Paste	C
Kiton Fast Yellow 3G	C
Lanasol Blue R	NC
Modern Violet	NC
Neolan Blue BR	NC
Neolan Blue 2G	NC
Neolan Blue GR	NC
Pyrogene Brown G	NC
Ultra Orange R	NC
Vat Golden Orange G Double Paste	C

JANUARY, 1927

Chromocitronine 3R	NC
Cloth Fast Yellow C	C
Eosin Methylene Blue	NC
Gentian Violet Pure	NC
Indigosol Black TB	NC
Leaf Green Stain	NC
Lemon Yellow Stain	NC
Madder Lake Powder	C
Neolan Green LBN Conc	NC
Pyoktamin Blue	C
Pyoktamin Yellow	C
Romanowsky Stain	NC

FEBRUARY, 1927

Alizarine Sapphire Blue SE	C
Rhodamine B Extra	C

SHIPMENTS OF LOGWOOD FROM MEXICO

For the first time since 1917 a shipment of Tabasco logwood will shortly be made to the United States from Frontera, Mexico. The wood is now being collected along the banks of the various rivers, and the first lot will begin to arrive soon in Frontera. There it will be assembled as quickly as possible, until a sufficient quantity is collected to furnish a full steamship cargo for New York, where the first shipment should arrive in about two months or ten weeks. This information is from Vice-Consul Harry B. Ott, Frontera, Tabasco.

THE PRODUCTION OF BRIGHT COLORS ON FABRICS

(*Continued from page 282*)

when the dyeing and topping baths are utilized to the utmost.

One piece of cotton cloth after the other is thus dyed and topped continuously, making its way in a dry condition in piece form on hand-truck U. During the dyeing operations roll after roll of cloth is entered before frame F, sewing its end rapidly to that of the piece being treated.

Advantages of the Plant

Several dyeing and topping effects can be produced on the cotton cloth goods. These can be dyed and topped so that both sides have exactly the same uniform color running all through; so that one side has a different topped effect than the other; so that the front of the pieces is topped more strongly or weakly than the back; so that the front has a topping and the back has no topping, or vice versa; so that the dyeing and topping is more or less pronounced; so that the dyeing and topping takes place only at intervals in the piece, all intermediate spaces remaining untreated; so that only dyeing and no topping is conducted, etc.

Besides the above advantages, the following may also be mentioned:

1. The cloth is dyed and topped in one run with a lower consumption of dyestuffs and a saving in labor, motive power, etc., than would be required when dyeing and topping in the ordinary way.

2. By regulating the pressure on squeeze rollers S and the speed at which the plant is run, more or less of the solution containing the coloring matter can be dried on the cloth as this passes on drying cylinders G.

3. The length of the treatment between the pairs of sprayers a, b, c, d can be regulated in seconds, carrying this out either during a slow or more rapid continuous passage of the goods or at regulated intervals while the goods remain stationary.

4. The drying cylinders (G) can be heated with the same hot air employed in the hollow plates m and n, so that here the drying can be done very rapidly or more slowly, in accordance with the nature of the goods treated, and if it is desired to top the dry or slightly moist goods.

5. The hot air required in the above plant is generated through a small apparatus by electricity.

6. If necessary, the bath of the direct color circulating between bell V and vat T can be kept at a certain temperature (60 to 70 deg. Cent.) by applying to the collar of the first an electric heater constructed like that used for heating water, through which large volumes of water can be heated within a comparatively short period of time.

7. The cotton cloth is obtained in piece form, and in some cases can be finished simply on the press.

(*To be continued.*)

The Dyer's School of Experience

[Editor's Note.—*The following narrative is one of a series being published under the general head of "The Dyer's School of Experience." Realizing that the genuine material for such a series is to be found largely among its own readers, The* Reporter *solicits contributions from that source and will pay for those accepted at regular space rates. Among the readers of this journal there should be many who have, in the course of their experience as dyers or chemists, encountered incidents which should prove most interesting and helpful to their fellows. Send all manuscripts to* American Dyestuff Reporter, *90 William Street, New York City.*]

AN EXPERIENCE IN HOSIERY DYEING

By Noel D. White
Davenport Hosiery Mills, Chattanooga, Tenn.

AFTER three months of wandering in Europe I decided to return to the United States. The trip had done me worlds of good, but I was still down on employers in general, and determined not to look for a job but start in business for myself.*

Looking over the ground for an opening I saw advertised in the Textile Colorist a dyehouse for sale. An old dyer wanted to retire and offered to sell his dyeing and cleaning establishment.

It was in a small city in western Pennsylvania. I hopped on a train and went to look the place over. It was an old shop, rickety and delapidated. No vats or kettles to speak of; several sawed-off barrels and washtubs. But there was a good new steam boiler. Before I decided I made inquiries and found that the city boasted of another dyeing and cleaning shop.

This other place was run by the daughter of the original proprietor, who had died the year before. She was married but her husband preferred to dabble in real estate rather than dyestuff and cleansing fluids. There was therefore no other competitor for me but a young woman, and although she was born and reared in the dyehouse, surely she could be no match for me. I went back before night and bought the place on condition that the old man stayed with me for two months until I learned the dry cleaning and got introduced to his trade. He was to do no work but act as adviser in what I was not familiar with. After a few weeks and before he had moved out he died, and I had to bury him.

From the start I saw that I was not in my right element. I pleased my customers and got a lot of work, but how I hated to clean garments and carpets! I longed

*In the preceding instalment the author related how he had lost his job as dyer through the unfair tactics of his employer and had gone to Europe for an extended tour.

for a real dyehouse with many people to work with. Here I was the fireman, the office boy, the dyer, the cleaner, the delivery boy and the bill collector. Yet with all the duty of my new work I had many afternoons to go fishing and enjoy myself, but I was not satisfied here.

A Trial Order for Sulphur Black

One day someone told me that a hosiery mill had started in the city. I went to see the proprietor and asked him to let me do his dyeing. I was shown through the mill. They were making half hose in cotton and mercerized. The proprietor said he did not think a garment dyer could handle mill work successfully, but I assured him I was capable of doing that kind of work to his satisfaction, and he finally agreed to let me try about 200 pounds of seconds on black. He said he wanted nothing but Sulphur Black, and if I could do it and the price was right, he would let me do it all. Glad at the prospect of starting to do real dyeing on new goods, I went home with my lot of stockings and sent off for the dyestuff and chemicals necessary.

Sulphur colors in those days were not very common, and I had to pay about 30 cents a pound for it; also it took about 30 per cent to start a bath, gradually reducing to 10 per cent for a standing bath.

I made up a bath in a 50-gallon barrel, added 2½ pounds soda ash and boiled it. Then I poured in my Sulphur Black which I dissolved in a tub with double the amount of sodium sulphide; then I added 5 pounds of salt and 5 ounces of caustic soda. I had bought enough to dye the amount of goods I had on hand, and had to do it in four batches. I had never before dyed any sulphur colors, but got the necessary instructions from the Berlin Aniline & Soda Fabrik, and as I knew I could trust them I went ahead without fear. For a whizzer I pressed my goods in an old wine press I had for family use, and I went happily about my work until the whole lot was finished and I delivered it.

When I got to the mill with the dyed lot he showed me how they were going to finish them. They had a hot chamber with racks in it. The stockings were stretched on wooden boards and placed in the chamber standing one beside the other on the racks, starting from the top; when the chamber was full they would start to take them off from the starting place, and as they took one off another stocking was put in its place in a continuous operation until the whole lot was dried.

A Novel Test for Fastness

Before he started drying them the man said he wanted to see if they were dyed Sulphur Black by a test he knew. And this is what he did: He asked for a pail of boiling water; then he took a can of lye, the same as my wife used to sprinkle in the kitchen sink on Saturday night, poured fully half of the can in that boiling water and stirred it with a stick. Next he took a handful of my dyed stockings, threw them in that solution and kept stirring them up for a little while. Finally he rinsed them in a pail of cold water. When he saw me smiling at that test he asked me if I had already tested them, but I informed him of the absurdity of such a test. I told him that textiles were not burned in order to find out if the colors were fast, and that is just what he was doing. After that he pronounced my color O. K., and said if I could give him a reasonable price he would be glad to let me do his dyeing.

That night I figured down to the lowest price I had to get to make a little profit out of that dyeing. When I went back and told him I would dye his sulphur blacks for 12 cents a pound he laughed, then went to his desk and produced a letter from a dyer in Reading, Pa., who offered to dye black for 5½ cents, brown for 6½ cents, lisle finish on both for one-half cent extra per pound. I told him I could not possibly see how it could be done. Dyestuffs alone would cost more than that. I suggested that maybe those prices were not for sulphur colors. He said that was what he must have. Then I said he had better send his work to Reading. Downhearted, I wended my way back to my dyehouse. My first thought was to throw out my standing bath and clean up the place of the vestiges of that experience, but thinking of so much dye in that bath yet unexhausted made me pause and I decided to keep it and maybe use it in some way.

The Penalty of Cheap Work

About two weeks later I had a call from that hosiery man. He wanted to see me on something urgent. But I had no desire to have anything more to do with him, and as I was busy anyway I let him wait. One day, however, some business took me past his mill and I dropped in to see what he wanted.

As he saw me, he smiled all over and said: "Come in and I will show you something that will interest you. Why did you not come any sooner?" I told him I had been very busy.

He went to his office and brought out a box of stockings. From it he took a pair and handing it to me said: "This is some of your dyeing." I looked at the stocking; it was black and it had been worn. The heel and toe had turned a greenish color, evidently from perspiration. I said to him that it was not my dye because I was positive my dye could not possibly turn green, but that it had the ear-marks of oxidized aniline black, badly processed, and was the work he was getting from Reading at 5½ cents a pound. He said that was just the case. He had 2,000 dozen sent to Philadelphia, and after that test they were all coming back to him.

"You got just what you can expect for the money," I told him; "I could dye Aniline Black for that price, but you told me you wanted Sulphur Black and that costs money."

"Can you do anything now to fix them?" he asked.

"I can redye them Sulphur Black for you at my price."

"All right," he said, "take them home."

Now I could use up my old standing bath with a profit. I figured the stockings were already black. A half hour boiling in a weak solution of Sulphur Black was all that would be necessary and I would not have to buy any dyestuff.

When I returned that lot I was ready to give up my dyehouse and willing to go back at my regular work. A friend of mine who was selling dyestuffs for a firm in Philadelphia recommended me to a silk thread manufacturer, and shortly after I was on my way to a new job in frozen Canada, where I was to be exiled for five years.

DR. KRAIS ON STANDARDIZATION OF COLOR FASTNESS

Prof. Dr. Paul Krais, chairman of the German Color Fastness Commission (formerly head chemist of the Bradford Dyers' Association), gave an account of the work done by the Commission in an address before the West Riding Section of the Society of Dyers and Colourists, at Bradford, on February 10. Ernest Hickson, president of the society, who was in the chair, says an account in the Journal of the Textile Institute, explained that the Society of Dyers and Colourists had appointed a committee with the object, in the first place, of standardizing fastness tests, so that the tests could be repeated in any part of the globe to prove a guarantee of fastness up to any particular standard in a court of law; and in the second place, to secure the classification of dyestuffs according to their degree of fastness. Similar work was being done in Germany and America, and as they had in view the establishing of international standards, they had invited Dr. Krais to come over to Bradford to tell them what the German Commission had been doing.

Dr. Krais said their first problem had been to decide how the grades of fastness should be numbered, and after careful consideration they had come to the conclusion that they should begin with No. 1 as the worst, running up to No. 5 as the best; or, in the case of fastness to light of dyeings on cotton and wool, up to No. 8. The most difficult question was that of fastness to light. The object of the committee was not to determine and standardize single dyestuffs, but dyed materials such as were usual in trade practice. They had selected, therefore, a series of dyeings of well-known fastness to light, without regarding their incongruence of shade. Victoria Blue B, precipitated on china clay, had been used for the purpose of forming a scale of exposure. Up to four hours' sunlight this color showed a marked difference for every half-hour. This was only a relative measure, and bleaching was quicker in some localities than in others, but when once the correction was done the measuring was simple. A little slip of blue paper was put beside the dyeings that were being tested, and by comparing the slips with the scale, the number of bleaching hours could be found. One of the most serious difficulties was that shades did not fade in the same way. One color might approach white; but other shades altered in hue, becoming grayish or brownish. Consequently the color-measuring methods invented by Ostwald were used. Another difficulty was the test for fastness to perspiration, because sweat might be acid, neutral, or alkaline, and contain larger or smaller quantities of salt or organic compounds. A compromise was effected by using a solution containing 50 gr. common salt and 2 c.c. concentrated ammonia liquor in 1 liter of distilled water. They were glad to say that the standards proposed by the commission had been adopted by the large German firms of dye makers in their daily routine work, and the large dye makers had also tabulated their dyestuffs in the order of their fastness properties according to the commission's methods. The German Patent Office had also accepted the methods. He suggested that it would save a good deal of time if the German standards were accepted as an international basis, and alterations and improvements made subsequently by mutual agreement.

NEW TEST FOR CUPRAMMONIUM RAYON

A new method of distinguishing cuprammonium from other types of rayon was recently announced by the Bureau of Standards, Washington.

The Bureau announcement states:

"In the manufacture of cuprammonium rayon, cotton, usually in the form of cotton linters, is dissolved in ammoniacal copper oxide and the resultant solution forced through spinnerets into a solution of an acid of caustic alkali. As all of the copper is not removed, a test for the latter affords a means of distinguishing this type of rayon from the other three. In the test a color is produced on the fiber which is characteristic of cuprammonium rayon."

Several months ago the Bureau of Standards announced a method of distinguishing viscose rayon.

ACETONE, AUSTRALIA

In view of the fact that sufficient acetone is not being manufactured in Australia to supply the local demand, the deferred duty on acetone of 30 per cent British preferential, 35 per cent intermediate, and 40 per cent general tariff, which was to become effective on January 1, 1927, has been postponed until July 1, 1927, according to advice from Assistant Trade Commissioner J. B. Foster, Melbourne.

After May 1 the Boston offices of Ciba Company will be located at 157 Federal Street. The change is made, the company states, in order to give dyestuff users quicker and better service, made possible by larger offices, laboratory and stock room.

AMERICAN
DYESTUFF REPORTER

Devoted to the use and application of dyestuffs and the mechanical equipment incidental thereto.

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THE TIN-WEIGHTING QUESTION

CAESAR had his Brutus, Charles I his Cromwell; the silk dyeing trade has its tin-weighting. Improper weighting, however, has not yet become so general as literally to threaten the life of the silk trade. That the condition will ever become so bad is improbable; on the other hand, it may conceivably grow worse than it is or it may not improve. In any case we shall always be able to find enough bad spots to point out as examples of a perfectly legitimate practice that got beyond control. The silk trade cherishes the hope that those who are guilty of excessive weighting will soon see the grievous error of their ways, and thenceforth conform to more ethical, or if you will, more scientific, practice.

In a review of the silk dyeing trade of 1926, published in the latest report of the Silk Association, Albert Blum, of the United Piece Dye Works, gives as the outstanding feature the development of weighted fabrics as contrasted to pure dye. In view of this trend he lays stress upon the urgent need for adhering to a practice of reasonably limited weighting.

Experts agree that moderate weighting, properly done, improves the goods. Much, very much, depends on the percentage of weighting. But it is also imperative that the process itself be rightly carried out, with certain technical facts kept clearly in mind. This much can be inferred from Mr. Blum's statements: The dyer must know how to dye, finish and pack weighted goods. His dyes should be carefully selected and skillfully applied with due regard to the effects of the weighting. The treatment which the fabric will later receive at the dry-cleaning plant must be understood and remembered by the dyer when he weights his goods, for the silk trade is now trying to co-operate with the dyers and cleaners. In other words, every dyer must conform to a standard of practice determined by the type of his particular work. In weighting as in dyeing, the man who controls the process must know his trade.

CHEMISTS CAN HELP

"THE chemist who makes an error of half a teaspoonful stands an excellent chance of being blown into eternity," observes a writer in the current number of Popular Science, discussing the importance of the metric system of measurement in laboratory work. Taken literally, this may be a slight exaggeration, but it is indeed true that the chemist in every industry depends every day on accurate measurement of the materials with which he works. But our American chemists are handicapped when they attempt to convey their findings to their less learned fellow workers, who have not been taught to measure in metric units.

The influence of those who urge the general adoption of the metric system by the people of the United States steadily becomes stronger. This month the second Pan-American Standardization Conference will be held in Washington. At the first conference of this kind, held in Lima, Peru, in 1925, the principle of standardizing our weights and measures on the world-uniform metric system was heartily indorsed, and work was actually begun toward unifying such standards for all American republics. The United States is now the only American republic not yet on the metric basis.

It is expected by metric advocates that the Washington conference will confirm this stand in favor of the metric measures. It should at least intensify the activity in bringing about their general use in merchandising.

A resolution pending before Congress provides for the adoption and use of the metric system in all merchandising after the year 1935. This bill is indorsed by many scientific societies and industrial associations, and by 300 chambers of commerce.

Chemists should keep informed on this movement toward general acceptance of the metric units in this country, and use every opportunity to speak a good word for the system of measurement that has become so indispensible to them in their daily work.

AT THE ECONOMIC CONFERENCE

MEN representing the commerce and industry of the larger nations of the world will gather at Geneva, Switzerland, this week to sit in at the Economic Conference called by the Council of the League of Nations. What effects their discussions will have upon modern international trade policies it is interesting to think about. Tariffs and commercial treaties are two of the main topics slated for discussion. The United States will be represented by five prominent delegates, among whom is Dr. Julius Klein, director of the Bureau of Foreign and Domestic Commerce. Of particular interest to American dye and chemical manufacturers is the fact that to the German delegation has been assigned the task of informing the conference upon the state of the chemical industry throughout the world. What Germany has to say about tariffs against her chemical products should be

significant. The statements of her delegates may protrude themselves next fall into the discussion of our own tariff, which is expected to loom as a major issue in the next session of Congress.

TEXTILE manufacturers have learned the value of joining hands and pooling their problems for the common good of the industry. They have even gone so far as to set up effective machinery for co-operation within each group—associations such as the Cotton Textile Institute, the Silk Association and the Wool Council. But there are areas of indifference between these and certain allied groups, namely the rayon and the dyestuff manufacturers. A little thought will show many reasons for closer co-operation between textile, rayon and dyestuff interests. Line up these three groups behind a well-financed technical research program and the result would ultimately be a powerful textile industry (using the word "textile" in its broadest sense) that could face the world unharrassed by any fear of depression.

THE DYESTUFFS PROBLEM

In each of the five great producing countries the manufacturers of dyestuffs are confronted with the problem of utilizing excess capacity. Germany makes about 70,000 tons of dyes a year, or about 35 per cent of what her plants are capable of turning out. The United States, with a capacity of about 57,000 tons, is making about 30,000. Great Britain produces about 17,000 tons in plants which could make 40,000. France shows the nearest approach to balance, capacity being approximately 22,000 tons and production about 16,000, or 72 per cent. In Switzerland the situation is much the same, with capacity around 16,000 tons and production at about 11,000, or 70 per cent.

The importance of the dyestuffs industry in the economy of nations extends far beyond the production of coloring matters. For its own requirements and the purposes of other industries, it manufactures a wide range of acids, solvents, salts, and other chemicals, intermediates, and by-products. It is the fertile field for synthetic chemistry, and as such yields a wide variety of drugs and pharmaceuticals. Its laboratories are the training ground for organic chemists in the practical applications of their science, and its plants, under modern conditions of warfare, are each a potential munitions factory.

Thus, in any country, prosperity in its dyestuffs industry assures benefits in many diverse fields, while the relation of the industry to national defense is now so vitally important that no country can contemplate without concern the scrapping of any considerable portion of its dyestuff capacity.—Industrial Bulletin of Arthur D. Little, Inc.

COPPER SULPHATE TRADE OF SWANSEA

The copper industry of Swansea, Wales (commenced over 200 years ago), has been on the decline for the past twenty-five years. The local industry is now practically in the hands of two concerns, the Rio Tinto Co. and the British Copper Manufacturers (Ltd.). Formerly, large quantities of copper ore were treated at the local plants, but in recent years imports of these ores have fallen off considerably, since it is no longer economical to handle ores so far away from the mines. The local works have therefore devoted their plants to the refining of copper, and to the manufacture of articles from imported copper bars and slabs, according to Consul J. J. C. Watson, Swansea.

The chief by-product of the industry is the manufacture of copper sulphate used for vine-spraying. Fifty per cent of the copper-nickel matte is stated to be used in this production. The manufacture and export of copper sulphate in 1926 was higher than in 1925. During the coal strike large shipments were made from stock. The export movement is seasonal, shipments being effected almost wholly in the first six months of the year.

SULPHUR DYEING IN THE PRESENCE OF CELANESE

(*Continued from page 276*)

the dyeing. If the bath shows signs of precipitation at any time, further slight quantities of hydrosulphite and Celascour can be added, but it is neither expedient nor necessary to make additions of sulphide.

Enter the goods at 50 deg. Cent. and raise to 70 deg. Cent. in fifteen minutes. Dye for three-quarters of an hour or to shade at this temperature, finally lifting, rinsing in hot water and then soaping well in a bath containing 2.5 grams per liter olive oil soap at 60 deg. Cent.

This method gives excellent results, free from rubbing and bronziness, and will be found quite as satisfactory as the older method with larger quantities of sulphide.

Resist Dyeing

A number of the sulphur colors show good resists against Celanese, with only 1 to 2 c.c. per liter Celascour in the dye bath. The concentration varies with the individual colors used and with the depth of shade required, but the dyer will have no difficulty in determining the amount required for the particular colors he is accustomed to using. As an excess of Celascour does not further improve the resist but only tends to reduce the yield of color on the cotton, a concentration of 10 c.c. per liter should usually be necessary only in a case of blacks and very heavy shades.

Salt may be employed in the dye bath in quantities up to 10 per cent on the weight of the goods, but caution should be used in making this addition, as in certain cases it tends to throw the color on to the Celanese and impair the result.

Where it is required that the Celanese component also should be dyed, this should be done in a fresh bath, using the SRA colors which are most fast to washing.

SILK INDUSTRY SURVEYED IN ASSOCIATION'S REPORT

Washing and Dry Cleaning Studied—Dyeing and Finishing Trades Reviewed

THE American silk industry made considerable progress last year in several branches in the face of unfavorable trade conditions, and laid the foundation for much constructive work toward solving a number of important problems, according to the annual report of the Silk Association of America, issued last week to the trade.

The report comprises a detailed survey of the entire silk trade and industry. It includes the secretary's lengthy review outlining the year's work in each division of the association, contains illuminating trade reports and statistics and lists the officers and managers, committees, divisions and members of the association.

Silk and Rayon Consumption

In the manufacture of silken things, largely for the use of American men and women, American mills consumed 96 per cent of the Japanese raw silk exports during 1926. European countries took the remainder from Japan.

The 1926 figures for American silk imports from Japan are 421,000 bales, or 84 per cent of the total American imports, which were over 504,000 bales. Of the balance of the silk imports, 15 per cent came from China, and about 1 per cent came from other countries, mainly France and Italy. American imports increased 3 per cent over the 1925 imports.

Regarding Chinese silk, American silk manufacturers took nearly one-half of the Shanghai exports, totaling approximately 41,000 bales, which in spite of the disturbances in that country, were a slight increase over the year previous.

Of the American production of rayon, the association's report for 1926 records a total of 62,816,000 pounds, or an increase of 21 per cent over the 1925 figure. The production figure is more than four times greater than is recorded for the year 1921, five years ago. Imports of rayon yarns, threads and filaments for 1926 are recorded at a total of over 10 million pounds, which is an increase of approximately 46 per cent over the year previous.

The following excerpts from the Silk Association's report will serve to indicate the nature of the technical research being carried on by the association through its various committees:

Formulas for Washing Silks

The Committee on Washing Silk Fabrics has during the year worked on a set of two formulas in place of the one originally intended. It has aimed to establish a formula for the trade in which technical information is to be given on the standard test for washfastness of dyed silk, and another formula or simple set of instructions for the general guidance of the consumer in washing silks.

The technical formula includes such details as the percentage of soap solution to be prepared for making washing tests and the degree of temperature of the water. As will be easily understood, such an ambitious program was a matter of extensive laboratory research, and the assistance of outside authorities has been both proffered and welcomed as supplementary to the findings of the laboratories of the committee members.

A great deal of experimentation was done on three items pertaining to washing silks, namely, water temperature, time of immersion and strength of soap.

The importance of the work of the committee was augmented by the prevalence of inconsistent washing directions distributed in the trade at the height of the season of washable silks, some of which would undoubtedly lead to the abuse of the fabrics and certain injury to the trade. The trade has a decided need for the formulas which the committee has prepared.

Working also on a suggestion of the Committee on Specifications for Government Bids, this committee took under consideration the formation of a proper specification for tests on fastness of color. It was agreed that the Government specifications should furnish more specially the amount of service and exposure to sunlight which the different items were intended to give.

Silk and Dry Cleaning

Meetings held during the year between dry cleaners and silk dyers and manufacturers were productive of many enlightening discussions. An intelligent survey of the situation was needed as certain problems incurred in the dry-cleaning process were being agitated.

Our members have conferred with representatives of the National Association of Dyers and Cleaners in their endeavor to discover causes of the damages to some silks in the dry-cleaning process. At the invitation of the silk manufacturers and dyers, these representatives have visited the mills and laboratories to observe the processes of manufacture, and to go into some of the difficulties with the chemists.

The silk men have also aided the dry cleaners by supplying them with dyed silk samples to be tested at the Bureau of Standards in Washington before practical recommendations can be made.

The following trade reports have been selected from those included in the Silk Association's annual report as being of particular interest to our readers, inasmuch as they review conditions in the silk dyeing and finish-

ing trade. They are published here in slightly abridged form:

Skein Silk Dyeing

Presented by B. J. Lanza, President of the Lanza Silk Dyeing Company, Paterson, N. J.

The branch of this great industry called skein silk dyeing has for some years back slowly decreased and is at present overshadowed by the rapid and tremendous growth of piece dyeing and finishing.

What was at one time a giant business is now dwarfed in proportions and left to the mercy of constantly changing moods and modes, and nothing but an unexpected turn of habits and styles can resurrect it to its former dominant position.

Whether this branch will once more grow or remain in its reduced state, we do not know; but we are certain of one thing, and that is that it will always be vital and important to the silk industry because many qualities of ribbons and broad silks, especially the artistic and most beautifully woven fabrics, must continue to depend upon it.

Recent improved conditions would indicate that we have passed the crisis as the demand for skein dyed weaves is noticeably on the increase. Also, skein dyeing seems to have fared much better during the past year than it has for a long time, and a gradual and steady improvement is anticipated for the future.

Conditions during 1926 might be summed up under three general heads: hosiery, tie goods, mufflers, linings, tapestry and hat bands were very good; velvets, ribbons, umbrella and dress silks were fair; vat dyes and shirtings were very poor. Taffetas were cautiously tried out by some manufacturers with very little success and encouragement in the market. . . .

No changes were noticeable in the labor situation, except the common alternating of the help from skein to piece dye shops and vice versa wherever the influx of work was greater and more attractive.

The large number of small lots continue to be extreme and very unprofitable. Poor quality and lousy silk is still with us and very much in evidence.

The practice of some throwsters to use heavy tints, mineral and unsaponifiable oils for soaking, is causing the dyer much trouble. The degummed liquor from the boil-off is very essential and necessary for the dyeing process, and unless it is free of tints, foreign and unsaponified matter, the shades dye unevenly and the silk loses its feeling and luster. Neatsfoot oil and olive soap emulsion for raw silk soaking still constitutes the best method, and co-operation in this instance from the throwster would greatly assist the dyer to better and more satisfactory results.

The scarcity and high prices of tetrachloride of tin and the high cost of soap and other commodities are being felt very keenly by piece and skein dyers.

The importance of rayon has been extended to many branches of the silk industry. The skein dyer generally finds rayon skein dyeing more or less troublesome in producing even shades, and unless done in very large quantities is not very profitable. . . .

Dyeing and Finishing

Presented by Albert Blum, Treasurer of the United Piece Dye Works.

The outstanding feature in a review of the piece dyeing industry for the year 1926 is the steady development of weighted fabrics as contrasted to pure dye. In other words, with the continued progress that is being made toward perfecting the handling of weighted fabrics, it has become evident that more classes of fabrics are being converted through the weighting process every day.

In view of this trend, I cannot emphasize enough what I have been preaching on behalf of my organization since the beginning of the weighting business; namely the necessity of keeping the limits of weighting to what we term the 25 to 35 per cent classification. This classification will give all the necessary hand to any kind of piece dyed fabric, preserve its natural luster, its full drapyness and avoid the danger of overweighting. Unfortunately, keen competition between manufacturers or converters has led them to place a great many goods on the market beyond this classification. While I agree that some weightings beyond 25 to 35 per cent may produce serviceable merchandise, the majority are not safe; and manufacturers and converters should bear in mind that there is danger which if abused may help to destroy the great popularity of silk fabrics in the United States markets.

As a result of long experience, we found it necessary, early in 1927, to lay down requirements on the construction of piece goods for weighting. These were:

1. Goods must be properly packed and protected to avoid chafing or shifting while in transit.

2. Light tinting should be used in throwing as in a season of light and pastel shades, it will materially reduce poor matches.

3. Width of flat crepe must be at least 43 inches in order to avoid tearing of edges, and give proper shrinkage averaging about 5 per cent; otherwise, 8 to 9 per cent will be required. Satin crepes should be 46 to 47 inches wide and require 6 to 7 per cent shrinkage. Canton crepes should be 47 inches wide, shrinkage 8 to 9 per cent or less if practical.

4. A leeway of 5 per cent above or below the amount of weighting asked for.

5. A few chafe marks or spots cannot be avoided and must be accepted as no claim will be allowed for minor defects of this kind.

A second announcement was made to clarify section three, stating: "When the proper twist is used, the indicated width of gray goods in flat crepe must be at least 43 to 44 inches in order to avoid tearing of edges and give proper shrinkage averaging about 7 per cent. Satin crepe should also be made with the proper twist and 43 to 44 inches wide in the gray to give proper shrinkage averaging about 7 per cent, or if the proper twist is not used we will require goods 46 to 47 inches wide to avoid the tearing of selvages. Canton crepes of necessity must be wider in the raw state than either of the two fabrics mentioned above and the shrinkage will average 8 to 9 per cent." We ended up this latter explanation with the following: "Trusting that you will appreciate this explanation and bear in mind that we are always constructive in our suggestions."

Co-operation with Cleaners

After a most instructive interview, only a few days ago, with members of the National Association of Dyers and Cleaners, and upon listening to some of their major complaints, I am more convinced than ever that our requests to the trade are well-timed. I assured this organization that the manufacturers as well as the dyers were willing to co-operate with them toward one end, that is to deliver for dress purposes, merchandise that would be entirely satisfactory to the wearers of silk dresses in the United States.

The volume of business throughout the markets in the year 1926 was satisfactory, but I fear that the prices obtained by our customers for the many qualities produced during that time were most unsatisfactory. One of the many reasons for this condition, I believe, is not the time-abused slogan of overproduction, but rather the overproduction of imperfectly constructed merchandise which, sold at a low price, of necessity compels the lowering of the prices for standard merhcandise.

Once again I maintain that if manufacturers and converters alike will follow our suggestions as given above, a great many causes for unsalable merchandise will be eliminated, and a more satisfactory price will be realized on the merchandise. . . .

Our silk industry has been passing spasmodically through acute periods of distress, and it is high time to stop, look and listen, and realize that the principle of mass production, or what is generally termed today in all industries the "Ford system," is not applicable to our industry in this time of hand-to-mouth buying—which will develop into chin-to-mouth buying. Instead of looking to increase our units for more production, it behooves us all to think of making our units more pliable for diversified production rather than to increase facilities for mass production of any one given article. . . .

Dyestuffs

Presented by H. A. Metz, President of General Dyestuff Corporation

The consumption of dyestuffs in this country during 1926 was somewhat greater than during the preceding year. The dyestuff business was fairly good during the spring of 1926, but declined during the summer months and again improved during the fall and early winter months.

Several new colors were placed on the market by the domestic manufacturers during 1926; a number of entirely new colors were imported and introduced to the trade. The silk dyer has never had so large a selection of dyestuffs from which to choose for his many-sided requirements, as he has at the present time.

During 1926 the dyestuff business with the silk manufacturers, and especially the printers, was quite good. The tendency of all consumers of dyestuffs has been to use faster colors. This is especially true of silk and piece goods where the requirement calls for faster-to-light and faster-to-washing colors. This requirement has been met by the introduction of a new line of colors which can be dyed neutral, produces perfectly level results, and possesses a very satisfactory fastness to washing.

There has also been an increased demand and use during 1926 for vat colors for silk for special requirements. There is a great variety of vat colors available at the present time, and the dyeings produced with these colors meet practically every requirement of fastness.

A new type of Sulphur Black has recently been introduced for silk skeins, possessing extraordinary fastness to washing and bleaching.

The tendency during the past year has been to use more tin-weighted silk than heretofore. This has more or less affected the selection and use of dyestuffs. Furthermore, there has been an increased use in the silk industry of mixed fabrics, such as silk, cotton and rayon for hosiery, wool and silk for umbrella material and dress goods. The use of these mixed fibers has necessarily increased the difficulties of dyeing, but the demand has been splendidly met, notwithstanding the complicated problems confronting the manufacturer and also the producer of dyestuffs.

Generally, mode shades or light shades predominated, especially for silk hosiery, during 1926; only towards the end of the year was there an increased demand for black.

Advertising plans of naval stores industry, decided upon at the meeting at Jacksonville, Fla., are being formulated by a committee who will begin a campaign to explain the value of naval stores to the public.

Technical Notes from Foreign Sources

Correction

In the January 24 issue of the REPORTER, on page 75, under the heading of Technical Notes from Foreign Sources, abstract entitled "Wax and Fat Content of Different Cottons," the reference should have read "Spinner und Weber," and note should also have been made that this material was originally published in the Journal of the Textile Institute.

In the February 21 issue of the REPORTER, page 141, the abstract entitled "Uneven Dyeings of Cotton" and accredited to "Deutsche Faerber Zeitung," note should also be made that this was originally published in the Journal of the Textile Institute.

Colored Reserves with Vat Dyestuffs Under Vat Colors

The goods are dyed with one or more vat dyestuffs with reserve neutral metallic compounds, and after steaming the dyeing is carried out in a color liquor which contains another member of the vat series. The reserve treatment ensues simultaneously in this dye liquor. The dyestuff that is being reserved can be overprinted and aftertreated with an alkaline solution which advantageously contains a reducing agent. Alkaline reacting substances, such as potassium carbonate, or reducing agents such as Rongalite C, ferrous sulphate and the like, or both at one and the same time, can be added to the reserve composition. Thus, a mixture of lead acetate, potassium carbonate, gum Senegal, kaolin and Indanthrene Yellow G can be used as a colored reserve composition in printing. The goods, without being steamed, are dried and then dyed in a hydrosulphite liquor with the addition of Indanthrene Blue RS. They are thereafter washed, soured and soaped with a boiling hot soap liquor. A yellow and a blue are obtained in this manner. (Austrian Patent No. 103,911.)

Influence of Ironing on the Fastness of Colors

Dyed cotton fabrics should always be fast to ironing, for the reason that they are often washed and also ironed. As far as dyed woolen fabrics are concerned, these are principally subjected to ironing before and after the piece of cloth is made into a garment. It is a fact, however, that dyeings not fast to ironing are not infrequently met on wool as well as on worsted goods. In these cases the action of ironing is very evident on the surface of the fabric. And this is so whether the fabric shrinks or not. Shrinkage is in fact a local condition. In treating woolen goods the effects of ironing may be removed by steaming, and in those cases where the fibers have been treated with a permanent size there is sufficient resistance afforded to the ironing effect.

In the case of cotton goods, however, the effect of ironing is less an action on the material itself than it is on the dyes which color it. In certain cases of dyed woolen goods, ironing has been found to cause the flowing of the color or rather its volatilization, as has been observed in certain Acid Orange dyes. The effect of the heat is also manifested in certain light colors, as for example light violets, but in this instance the action is not a true volatilization of the color. A similar effect is found at times after drying and perhaps after steaming, as well both in cotton and woolen goods when they are allowed to remain undisturbed after drying. Inasmuch as the outer edges of the fabrics are in contact with the atmosphere, they naturally become saturated with atmospheric moisture, while the inner portions of the piece goods are not affected in this way, as they are not in contact with the air. The result then is that the outer edges of the fabric attain a shade which is different from the rest of the fabric. This phenomenon is particularly manifested in certain special cases.

Cottons dyed with certain substantive violet dyestuffs show the same phenomenon. Not many violets are known which undergo this change in shade, and often when it is found that the yarn, after exposure to air, becomes darker in places, the conclusion is at once reached that the fibers have not been properly dyed.

To-day the dyer is not very much afraid that the dyed product will not be resistant to ironing and particularly that the color will volatilize under the effect of the heat. But there is in fact a difference in the methods of ironing used to-day. In some cases the material is ironed while dry and in others it is ironed while wet. Both of these operations cause different changes in the dyed fabric. Most of the colors that are used to dye cotton piece goods are fast to dry ironing and these colors may be members of the direct, sulphur, vat or basic series of dyestuffs. It is really remarkable that in certain of the vat dyestuffs, which are otherwise fast to all influences, a certain temporary change should be noted during the ironing process, and this is also true in ironing fabrics which have been dyed with Para Red.

When the ironing process is carried out with steaming, then its action is much stronger on the color. When materials dyed with direct colors are ironed in this fashion, there is great danger that the color will run and soil the white portion of the fabric or other white fabrics. The diazotized and developed colors are faster to wet ironing than the direct dyestuffs. While the basic dyeings are quite stable—and those obtained with the aid of sulphur colors

eminently so—some of the violets, for example, obtained with the aid of vat dyestuffs temporarily change their shade in wet ironing. (Deutsche Faerber Zeitung, 1927, page 217.)

Action of Sulphuric Acid on Dry Cotton Fabrics

Transparent or wool-like effects are produced on cotton fabrics or a linen-like effect is obtained on fabrics which have been woven from coarser grades of cotton fiber by subjecting them to the action of sulphuric acid of at least 50 deg. Be. concentration at a temperature in excess of 5 deg. Cent. and with an acid of less than 50 deg. Be. concentration at a temperature below 0 deg. Cent. The different effects also naturally depend on the aftertreatment or preliminary treatment of the fibers with lyes with or without stretching. The unexpected observation has been made that when the fabric, instead of being entirely dry, contains at least 30 per cent of moisture, and is treated with sulphuric acid of the same concentration as has been indicated above, a weaker action is not obtained as might have been expected from the dilution of the acid with the water in the fibers, but the action is much more pronounced. The difference in the intensity of the action and of the change in the fibers, brought about in this manner, is by far greater than that occasioned by the use of cooled acid or acid at the normal temperature.

This remarkable action, which appears to be contrary to chemical law, which states that the greater the concentration of the acid, the greater will be its action, is perhaps explained when it is assumed that in one case the acid acts more quickly and penetrates more deeply into the internal structure of the fiber than in the other. Inasmuch as these differences in the action of the acid are observed to be similar whether the acid is allowed to act for a long time on the fiber or for a short time only, then the idea of more rapid penetration of the acid into the fibers is not a satisfactory explanation of this difference. The reason for this difference must be sought in the fact that water forms a path for the acid to penetrate into the fibers, and the result is that the fabric is more intensively acted upon by the acid than when dry. The technical application of this process makes it possible to reduce the concentration of the acid to a considerable degree or to shorten the time of the treatment, which is of similar technical importance, in order to obtain the same effects as are obtained on the dry fabric. Furthermore, new effects can be produced by treating the wet fabric. Certain examples follow.

Mercerized muslin is moistened until it uniformly contains approximately 80 to 100 per cent moisture, and it is then treated with sulphuric acid of 1.535 specific gravity equivalent to 50.3 deg. Be. The treatment is carried out at 5 deg. Cent., and lasts for one minute. The product obtained in this manner has a full, wool-like appearance and handle. A dry fabric treated in the same manner possessed none of these characteristics.

Non-mercerized muslin is moistened as in the former case, and then treated with sulphuric acid of 1.530 specific gravity for one minute at 0 deg. Cent. The product obtained has a decided wool-like appearance and is strongly shrunk. The same treatment on a dry fabric showed a much lesser shrinkage.

Mercerized muslins are moistened in the manner explained above and then treated with acid of 1.530 specific gravity for one to two minutes at a temperature of 0 deg. Cent. After mercerization with caustic soda lye with stretching, a fine transparent effect is obtained, and the fabric is found to be considerably softer than the transparent fabrics obtained with the dry goods. (Deutsche Faerber Zeitung, 1927, p. 594.)

Dyeing Felt Hats

It is essential that the dyestuffs used in the coloring of felt hats should penetrate well and be fast to sea water and perspiration. Satisfactory dyes include Azo-Rhodine 2G, Erio Phloxine 2GL, Xylene Light Yellow 2G, Lissamine Fast Yellow, Cyananthrol R, Alizarine Delphinol SEN and Wool Green S. Alizarine Saphirol B is not suitable, since though it has good penetrating powers, it is readily affected by sea water. Phenylamine Black 4B is the most suitable acid black, through Naphthalene Blue Black is used widely.

Dyeing is carried out at a temperature of 120 deg. Fahr. in the presence of 10 to 20 per cent of Glauber salt. If acid is added, a procedure which is frequently unnecessary, it is not added until the end of the dyeing operation. The dyed hats are then proofed with a solution of shellac and borax, the rim being proofed more thoroughly than the crown. When bleached shellac is used, the salt present may act as sea water. (Dyer and Calico Printer, 1927, Vol. 57, pp. 28-29.)

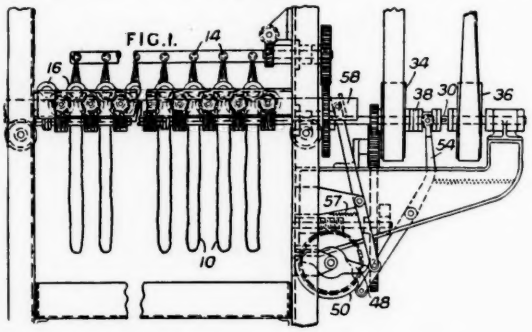
Fastness of Logwood on Rayon and Wool

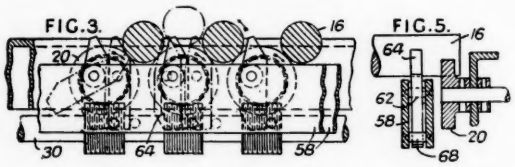
Logwood is capable of yielding good fast blacks on wool, cellulose and cellulose acetate artificial silks. When logwood is correctly applied to chrome mordanted wool, particularly when the mordant is fully reduced, the resulting black shade is exceptionally fast to potting. The most satisfactory method for dyeing logwood on wool consists of boiling the wool for a period of twenty minutes in a solution which contains 2 per cent (calculated on the weight of the wool) of sodium chromate, then adding 2½ per cent of sulphuric acid during the next twenty minutes. Then 1 per cent of sodium thiosulphate is added, and after further boiling for thirty minutes, the bath is completely exhausted of chromium so that the logwood may be added to the same liquor and the dyeing is then completed. Fustic, which is also extremely fast

to light, milling and potting, may be similarly dyed. Logwood shades on cellulose and cellulose acetate silks using a chrome mordant are also very fast to light, washing and other influences. They are not skin irritants. (Textile Argus, 1927, Vol. 3, p. 2.)

Treating Skeins with Liquids

In apparatus for the fluid treatment of hanks or skeins, suitable for bleaching, dyeing, washing and other chemical treatment, oxidizing or drying by gas or jets of air, the hanks 10, as shown in the accompanying illustration, suspended on rods 16, are supported on rotating rollers 20 and are passed along the machine by means of reciprocating bars 58 carrying pivoted pawls 64 which move each rod 16 over one supporting roller 20 into the next forward position, and at the return stroke of the bar 58 pass idly into position behind the next rod 16 in readiness for the next forward movement. The rollers 20 are driven by worm gearing from a shaft 30 rotated alternately forwards and backwards by means of suitable belt gearing 34 and 36, a clutch 38 therefor being operated by means of a cam 50 which acts through a lever 54. The bars 58 are reciprocated by cams 48 co-operating with a spring 57. The bar 58 is made in two parts between which the pawls 64 are pivoted at 62 and stops 68 insure the positive forward movement and the idle backward movement. Spray pipes 14 are shown. (British Patent No. 258,544.)





POLISH CHEMICAL INDUSTRY REPORTS GOOD YEAR

The annual report of the Chief Council of the Polish Chemical Union covering the year 1926 states that during 1926 the industry did a rather good business in all its branches. Not even the decline in general conditions toward the end of the year affected the industry. Employment in the chemical industry increased from 26,969 in January, 1926, to 39,818 in June, and since July kept steadily at about 31,000 until the end of the year. According to the report, the above conditions were not a reflection of a permanent pick up, but merely a result of the extraordinary international situation, of which full advantage had been taken. Forecasts for 1927 are not very encouraging and, even under the best conditions, 1926 business standards will be hard to maintain. (Acting Commercial Attache Ronald H. Allen, Warsaw.)

PRATT ALUMNI DINNER A HUGE SUCCESS

A renewal of old friendships, a quickening of the old "Pratt spirit" and a genuine jolly good time characterized the twenty-eighth annual dinner of the Pratt Chemical Alumni Association held in the McAlpin Hotel, New York, on Thursday evening, April 21.

The number of those who attended, alumni members old and young and their friends, assured one of the largest, liveliest dinners yet held. Every branch of the chemical and dyestuff trades was well represented. "Ye Olde Guarde" turned out to give a royal welcome to the newer members, and treated them to a fine display of spirit with their contributions to the scholarship fund. The one regret of the evening was that Charles Pratt, founder of the Institute, was prevented from attending by illness at home.

Toastmaster Arthur Wiehl presided in his usual happy manner at the board. He first introduced Dr. Elvin H. Killheffer, of the Newport Chemical Works, assigned to speak on "Prohibition As It Affects the Dyestuff Industry," who entertained with a variety of sparkling remarks. Richard H. Lersner, a former president, and active member of the association, gave an inspiring talk on what Pratt Institute is doing for students of chemistry, and announced that the Alumni had been most gratified by the generous response to the call for scholarships, seven of which had been awarded by members and private firms. Mr. Lersner then presented the annual medal of the Alumni Association to Joseph E. Mitchell for the highest scholarship of the term.

Charles M. Allen, director of the Chemical Course at the institute, briefly reviewed the origin and development of the course and echoed the keynote of the dinner with a few words on "Pratt spirit." Samuel S. Edmands, director of the School of Science and Technology, who followed Mr. Allen, spoke highly of his efforts in bringing the course to its present form, and insisted that it has always had a good year while under the direction of Mr. Allen.

William A. Black was elected president of the association for the ensuing year, and George Alpers secretary and treasurer, succeeding John H. Beach and John J. Sokolinski.

The evening closed with six acts of cabaret and entertainment.

LOWELL ALUMNI TO FORM NEW YORK BRANCH

Annual Meeting of Alumni on May 21

At least seventy-five New York members of the Lowell Textile School Alumni Association will attend a dinner on May 7 at the Fraternity Clubs, 22 East Thirty-eighth Street, New York City. Formation of a New York Branch will be proposed, and any members of the Alumni Association interested in the project are urged to communicate with H. A. Currier, 25 Madison Avenue, New York.

The annual meeting of the Lowell Textile School Alumni Association will be held in Southwick Hall, of the school on May 21. Following a business meeting in the morning the members will watch a baseball game between the old-timers. After a buffet lunch the L. T. S. team will meet their rivals, Worcester Polytechnic, on the Lowell diamond. A banquet will be held in the evening.

It was voted to recommend to the Alumni at the annual meeting that the $1,000 bequest of the late James T. Smith be funded as a scholarship in memory of Mr. Smith. It was also voted to found another scholarship, by popular subscription among the Alumni and its friends, to be known as the "Stephen E. Smith Scholarship."

RESEARCH THE TOPIC AT TEXTILE INSTITUTE CLUB MEETING

Gathering for the express purpose of discussing technical textile research, the Textile Institute Club will hold a session in the Hotel Traymore, Atlantic City, on Friday, May 13—the same day on which the National Association of Cotton Manufacturers and the American Cotton Manufacturers' Association will hold their joint convention.

The Textile Institute Club is an independent organization of members in this country of the well-known Textile Institute of Manchester, England.

Several interesting papers will be presented. William M. Corse, secretary of Directors of Industrial Research, Washington, D. C., will speak on "Outstanding Research Accomplishments and Methods of Leading Industries." A report of a survey of "Existing Textile Technical Research Facilities in the United States will be delivered by C. H. Clark, secretary-treasurer of the club.

The Executive Committee of the Textile Institute Club is as follows: George L. Gilmore, proprietor, Middlesex Bleach, Dye & Print Works, Somerville, Mass., chairman; James T. Broadbent, president, Standard Textile Products Company, New York City, vice-chairman; C. H. Clark, editor, Textile World, Boston, Mass., secretary-treasurer; Daniel E. Douty, vice-president and general manager, U. S. Testing Company, New York City; Franklin W. Hobbs, president, Arlington Mills, Boston, Mass.; Edwin H. Marble, president, Curtis & Marble Machine Company, Worcester, Mass.; Brackett Parsons, assistant treasurer, Ipswich Mills, Boston, Mass.; A. M. Tenney, Wellington, Sears & Co., New York City; E. D. Walen, assistant agent, Pacific Mills, Lawrence, Mass.

PHILADELPHIA TEXTILE RECEIVES SESQUI DIPLOMA

The Philadelphia Textile School of the Pennsylvania Museum and School of Industrial Arts recently received the handsome official diploma awarded to it as the grand prize by the Educational Jury of Awards at the Sesqui-Centennial Exposition in Philadelphia last year. This diploma is engraved with the following lines, defining the honor thus bestowed on the school:

"Excellence of course of instruction pertaining to the manufacture of textiles from the raw material to the finished fabric. Exemplified by the commendable exhibit of student productions of cotton, wool, worsteds and silk, at all stages of designing, weaving, chemistry, dyeing and finishing."

The Jury of Awards also awarded diplomas and medals to four of the principal department heads, in recognition of their part in collaborating with the school in carrying out the plan of instruction. This notable additional honor was awarded to Director E. W. France; Bradley C. Algeo, Professor in charge of Weaving and Fabric Analysis; Richard S. Cox, Professor in charge of Jacquard Design and Color Work, and Elmer C. Bertolet, Professor in charge of Chemistry, Dyeing and Printing.

TECHNICAL SERVICE ANNOUNCED BY PROCTER & GAMBLE

A Textile Research Department has been established by Procter & Gamble, with laboratory headquarters at 80 Ryle Avenue, Paterson, N. J.

The new department will be under the direction of N. S. Cassel, who will be assisted by a staff of technical men from the Chemical Division of the company. The entire time of this staff will be devoted to a study of processing problems encountered particularly by silk dyers and finishers, comprising the uses of soap, dyeing, bleaching, weighting, rayon processing and silk finishing.

NEW SULPHUR AND ACID COLORS AMONG NATIONAL DYES

An important addition to the line of acid blues manufactured by National Aniline & Chemical Company has been announced under the name of National Alphazurine B Conc., and a new sulphur color has been developed by this manufacturer and placed on the market as National Sulphur Orange G. Conc.

The new Alphazurine, it is mentioned, will be spe-

cially useful to dyers of wool and silk, as well as other substances. It is described as being very soluble, and level dyeing, and can be used either as a self color or in combinations.

Sulphur Orange G. Conc., it is claimed, possesses good fastness to light and washing, especially when aftertreated with copper sulphate, and excellent solubility. It is said to be particularly useful in dyeing cotton not only for self shades, but in combination with other sulphur dyes for browns, tans, etc. It is recommended further for piece goods dyeing in jigs and continuous dyeing machines, as well as for raw stock and yarns in all types of modern pressure-dyeing apparatus.

B. P. Ducas, Inc., is now located in its new offices at 271 Madison Avenue, New York City.

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACT OF CONGRESS OF AUGUST 24, 1924, OF AMERICAN DYESTUFF REPORTER.

Published biweekly at New York, N. Y., for April 1, 1927.

State of New York, County of New York, ss.:

Before me, a notary public in and for the State and county aforesaid, personally appeared Alfred P. Howes, who, having been duly sworn according to law, deposes and says that he is the publisher of the American Dyestuff Reporter, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management, etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 445, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor and business manager are:
Publisher—Alfred P. Howes, 90 William Street, New York City. Editor—Louis A. Olney, Lowell, Mass. Managing Editor—Clayton Hoagland, 90 William Street, New Yo.k City. Business Manager—Alfred P. Howes, 90 William Street, New York City.

2. That the owner is: Howes Publishing Company, Inc., 90 William Street, New York City; Alfred P. Howes, 90 William Street, New York City; Mary K. Howes, Northampton, Mass.; J. T. Howes, Rutherford, N. J.; D. C. Howes, Rutherford, N. J.; Louis A. Olney, Lowell, Mass.; William F. Collins, Upper Montclair, N. J.; Derfla H. Collins, Upper Montclair, N. J.; William H. Collins, Upper Montclair, N. J.; Joseph L. Schroeder, Hartsdale, N. Y.; N. H. Hiller, Carbondale, Pa.

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Alfred P. Howes, Publisher.

Sworn to and subscribed before me this 29th day of March, 1927.

[Seal] Caroline Essenbreis.

(My commission expires March 30, 1927.)

PRINTING COLORISTS ORGANIZE

A meeting of textile printing colorists at the Providence Biltmore Hotel, Providence, R. I., on April 2, resulted in the organization of the National Association of Printing Colorists. The final organization meeting was voted to be held May 7, in Providence, and plans for a membership drive were completed.

A very interesting and informative address on Coal Tar Chemistry and Dyes illustrated by a motion picture was delivered by August Merz of Heller & Merz Company, Newark, N. J., before the Paint and Varnish Superintendents Club of Philadelphia, at the Hotel Vendig, Philadelphia, on April 21.

Mr. Merz gave a most entertaining account of the chemistry and manufacture of the principal dyestuffs and of the various applications in both the textile, paint and other industries, with particular emphasis on lakes and pigments.

The rate for "Position Wanted" advertisements in this column is 2 cents a word—with a minimum of 50 cents per insertion. For all other types of advertisements—i. e., help wanted, machinery or supplies for sale—the rate is $5.00 per column inch or less per insertion.

CHEMIST

Chemist with ten years' experience in the dyestuff industry, including research and plant supervision, desires position with a chemical concern in this or other field. Available immediately. Address Classified Box 383, American Dyestuff Reporter.

SALESMEN

Salesmen—two, for Pennsylvania and Canadian territories. Textile school graduates with mill experience preferred. Give full particulars. Address: Classified, Box 385, American Dyestuff Reporter.

CHEMIST-DYER

Experienced textile chemist and dyer particularly qualified to carry out installation of application of vat colors to cotton piece goods. Immediately available. Address Box 386, American Dyestuff Reporter.

BUSINESS WANTED

Want to hear from owner with good business for sale, cash price, particulars. D. F. Bush, Minneapolis, Minn.

HOSIERY DYER

Wanted—Silk full-fashioned hosiery dyer. Experienced and thoroughly conversant in not only Japan silk dyeing but also artificial silk and wool mixtures. Must also do resist dyeing. Address Classified Box 387, American Dyestuff Reporter.